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Cyclopenta[a]naphthalene derivatives

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The present invention relates to cyclopenta[a]naphthalene derivatives, to liquid-crystalline media comprising these derivatives, and to electro-optical display elements containing these liquid-crystalline media. In particular, the invention relates to cyclopenta[a]naphthalene derivatives of negative dielectric anisotropy.

Liquid crystals have found widespread use since the first commercially usable liquid-crystalline compounds were found about 30 years ago. Known areas of application are, in particular, displays for watches and pocket calculators, and large display panels as used in railway stations, airports and sports arenas. Further areas of application are displays of portable computers and navigation systems and video applications. For the last-mentioned applications in particular, high demands are made of the response times and contrast of the images.

The spatial arrangement of the molecules in a liquid crystal has the effect that many of its properties are direction-dependent. Of particular importance for use in liquid-crystal displays are the optical, dielectric and elasto-mechanical anisotropies. Depending on whether the molecules are oriented with their longitudinal axes perpendicular or parallel to the two plates of a capacitor, the latter has a different capacitance; in other words, the dielectric constant ε of the liquid-crystalline medium has different values for the two orientations. Substances whose dielectric constant is greater when the longitudinal axes of the molecules are oriented perpendicular to the capacitor plates than when they are oriented parallel are referred to as dielectrically positive. In other words, if the dielectric constant $\varepsilon_{\parallel}$ parallel to the longitudinal axes of the molecules is greater than the dielectric constant $\varepsilon_{\perp}$ perpendicular to the longitudinal axes of the molecules, the dielectric anisotropy $\Delta\varepsilon = \varepsilon_{\parallel} - \varepsilon_{\perp}$ is greater than zero. Most liquid crystals used in conventional displays fall into this group.

Both the polarisability of the molecule and the permanent dipole moment play a role for the dielectric anisotropy. On application of a voltage to the

display, the longitudinal axis of the molecules orients itself in such a way that the larger of the dielectric constants becomes effective. The strength of the interaction with the electric field depends on the difference between the two constants. In the case of small differences, higher switching volt-

5   ages are necessary than in the case of large differences. The introduction of suitable polar groups, such as, for example, nitrile groups or fluorine, into the liquid-crystal molecules enables a broad range of working voltages to be achieved.

10   In the case of the liquid-crystalline molecules used in conventional liquid-crystal displays, the dipole moment oriented along the longitudinal axis of the molecules is larger than the dipole moment oriented perpendicular to the longitudinal axis of the molecules. The orientation of the larger dipole moment along the longitudinal axis of the molecule also determines the

15   orientation of the molecule in a liquid-crystal display in the field-free state. In the most widespread TN ("twisted nematic") cells, a liquid-crystalline layer with a thickness of only from about 5 to 10 µm is arranged between two plane-parallel glass plates, onto each of which an electrically conduc-tive, transparent layer of tin oxide or indium tin oxide (ITO) has been

20   vapour-deposited as electrode. A likewise transparent alignment layer, usually consisting of a plastic (for example polyimides), is located between these films and the liquid-crystalline layer. This alignment layer serves to bring the longitudinal axes of the adjacent liquid-crystalline molecules into a preferential direction through surface forces in such a way that, in the

25   voltage-free state, they lie uniformly on the inside of the display surface with the same alignment in a flat manner or with the same small tilt angle. Two polarisation films which only enable linear-polarised light to enter and escape are adhesively bonded to the outside of the display in a certain arrangement.

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By means of liquid crystals in which the larger dipole moment is oriented parallel to the longitudinal axis of the molecule, very high-performance displays have already been developed. In most cases here, mixtures of from 5 to 20 components are used in order to achieve a sufficiently broad

35   temperature range of the mesophase and short response times and low

threshold voltages. However, difficulties are still caused by the strong viewing-angle dependence in liquid-crystal displays as are used, for example, for laptops. The best imaging quality can be achieved if the surface of the display is perpendicular to the viewing direction of the observer. If the display is tilted relative to the observation direction, the imaging quality deteriorates drastically under certain circumstances. For greater comfort, attempts are being made to maximise the angle through which the display can be tilted from the viewing direction of an observer without significantly reducing the imaging quality. Attempts have recently been made to improve the viewing-angle dependence using liquid-crystalline compounds whose dipole moment perpendicular to the longitudinal axis of the molecules is larger than that parallel to the longitudinal axis of the molecule. The dielectric anisotropy $\Delta\varepsilon$ is negative. In the field-free state, these molecules are oriented perpendicular to the glass surface of the display. By achieving a plurality of domains, it has been possible to achieve an improvement in the viewing-angle dependence using liquid-crystalline media of negative dielectric anisotropy. This technology can also be used to achieve shorter response times in displays and better contrast values. Displays of this type are known as VA-TFT ("vertically aligned") displays.

DE 44 34 975 A1 discloses tricyclic compounds of the general formula
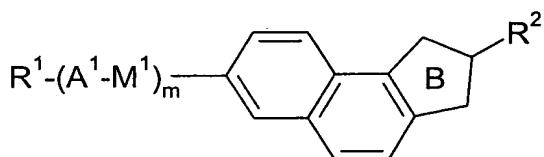
in which the symbols and indices are defined as follows:

R^1 is -F, -CN, -Cl, -CF$_3$ or has, independently of R^2, one of the meanings mentioned for R^2;

R^2 is H or a straight-chain or branched alkyl radical having from 1 to 20 carbon atoms (with or without an asymmetrical carbon atom), in which, in

addition, one or more $-CH_2-$ groups (but not those bonded directly to the five-membered ring) may be replaced by $-O-$, $-S-$, $-CH=CH-$, $-C{\equiv}C-$, cyclopropane-1,2-diyl, $-Si(CH_3)_2-$, 1,4-phenylene, 1,4-cyclohexylene, 1,3-cyclopentylene, 1,3-cyclobutylene or 1,3-dioxane-2,5-diyl, with the proviso that oxygen atoms and sulfur atoms must not be bonded directly, and in which, in addition, one or more H atoms of the alkyl radical may be substituted by F, Cl, Br or OR^3 (where R^3 = H or straight-chain C_1-C_6-alkyl), or an optically active or racemic group;

Ring B is
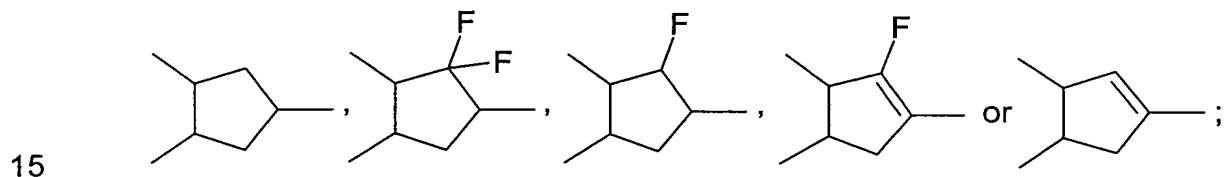
A¹ is 1,4-phenylene, 1,4-cyclohexylene, pyridine-2,5-diyl, pyrimidine-2,5-diyl, 1,3,4-thiadiazole-2,5-diyl, 1,3-thiazole-2,5-diyl, 1,3-thiazole-2,4-diyl, in which, in addition, one or more hydrogens may be substituted by F;

M^1 is a single bond, $-C{\equiv}C-$, $-CH_2CH_2-$, $-O-CO-$, $-CO-O-$, $-CO-$, $-OCH_2-$, $-CH_2O-$ or $-O-CO-O-$; and m is zero or one.

US Patent Application US 2003/0108684 A1 furthermore discloses tricyclic compounds of the general formula
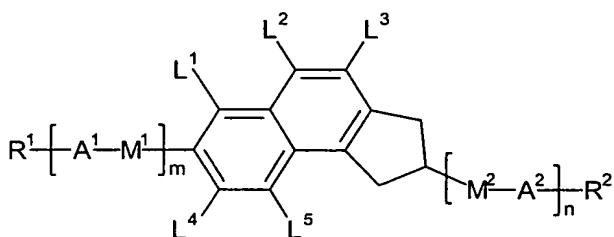
in which the symbols and indices are defined as follows:

R^1 is H, F, CF_3, OCF_3, OCF_2H, $OCFH_2$, an alkyl radical or an alkoxy radical or an alkenyl radical or an alkenyloxy radical; R^2 is H or an alkyl radical or an alkoxy radical or an alkenyl radical or an alkenyloxy ad; M^1 is -C(=O)O-, -OC(=O)-, -CH$_2$O-, -OCH$_2$-, -OCF$_2$-, -CF$_2$O-, -C≡C-, -CH$_2$CH$_2$-,

5   -CF$_2$CF$_2$-, -CF=CFC(=O)O- or a single bond; M^2 is -C(=O)O-, -OC(=O)-, -CH$_2$O-, -OCH$_2$-, -CH$_2$CH$_2$-, -CF$_2$CF$_2$- or a single bond; A^1 and A^2 are phenylene-1,4-diyl or cyclohexane-1,4-diyl, each of which is unsubstituted or mono- or disubstituted by F, or cyclohexene-1,4-diyl or 1,3-dioxane-2,5-diyl, each of which is unsubstituted or monosubstituted by F; m and n are

10   0 or 1, where m+n = 0 or 1; L^1, L^2, L^3, L^4 and L^5 are, independently of one another, H or F, where at least one of L^1, L^2, L^3, L^4 and L^5 is F, L^1, L^2 and L^3 are H if L^5 is F, and L^4 and L^5 are H if L^3 is F. The five-membered ring fused to the naphthalene structure has (with the exception of two intermediates containing a cyclopentanone ring which are formed in the synthesis

15   of the above-mentioned compounds) no further substituents apart from the -(-M^2-A^2-)$_n$-R^2 radical and also contains no further endocyclic double bonds.

However, the dielectric anisotropy Δε of the compounds disclosed in these

20   two documents is not sufficient to ensure satisfactory properties, in particular sufficiently low characteristic voltages, for example in VA-TFT displays.

Development in the area of liquid-crystalline materials is far from complete.

25   In order to improve the properties of liquid-crystalline display elements, attempts are constantly being made to develop novel compounds which enable such displays to be optimised.

An object of the present invention is therefore to provide compounds hav-

30   ing advantageous properties for use in liquid-crystalline media. They should preferably have negative dielectric anisotropy, which makes them particularly suitable for use in liquid-crystalline media for VA displays.

This object is achieved in accordance with the invention by a cyclopenta-

35   [a]naphthalene derivative of one of the general formulae I, II, III, IV and V

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I

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II

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III

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IV

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V

in which:

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$$d \quad , \quad e \quad , \quad f \quad ,$$

$$g \quad , \quad h \quad \text{or} \quad i \quad ;$$
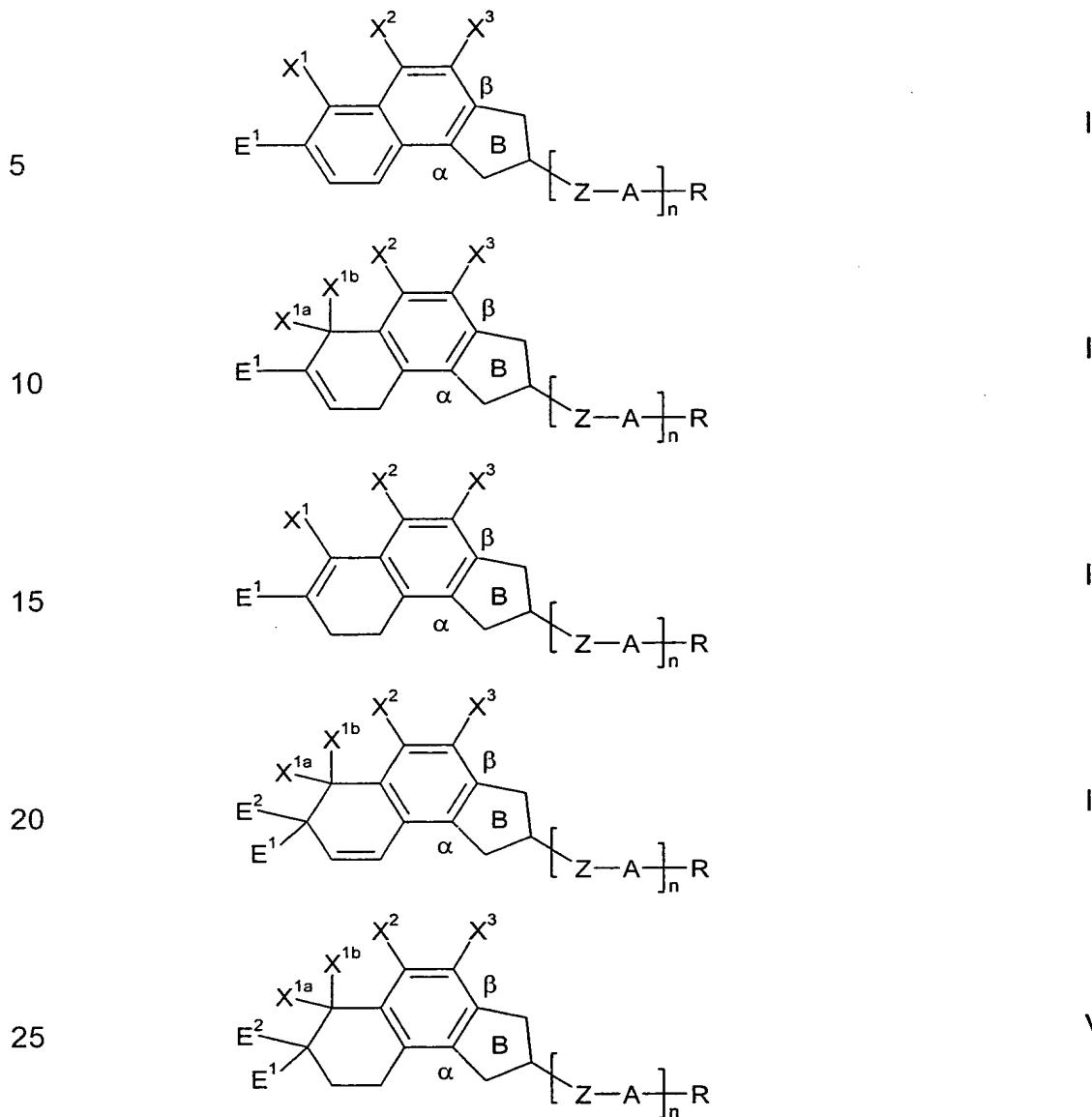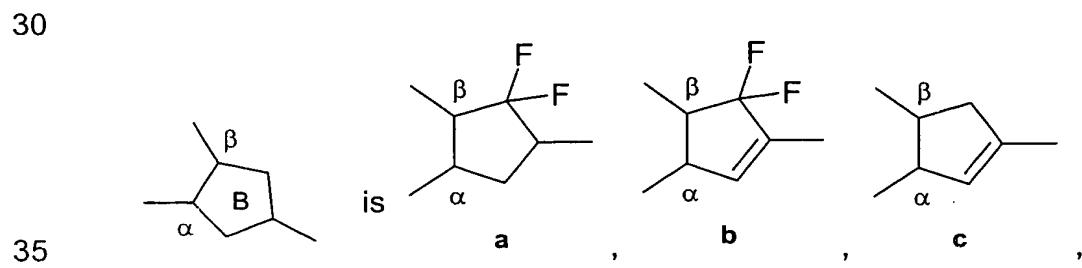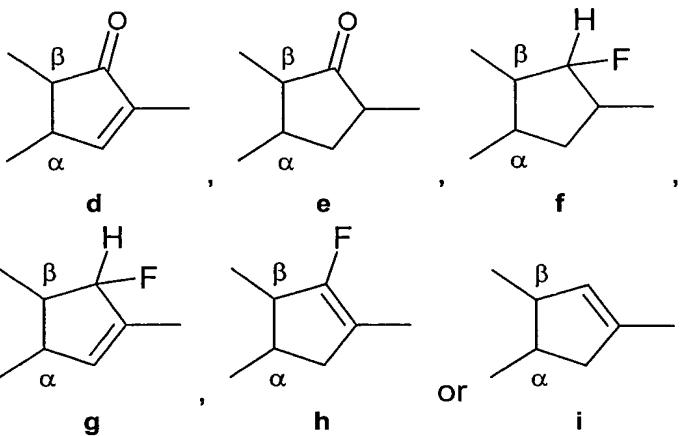
A   is in each case, independently of one another, 1,4-phenylene, in which =CH- may be replaced once or twice by =N-, and which may be monosubstituted to tetrasubstituted, independently of one another, by halogen (-F, -Cl, -Br, -I), -CN, -CH$_3$, -CH$_2$F, -CHF$_2$, -CF$_3$, -OCH$_3$, -OCH$_2$F, -OCHF$_2$ or -OCF$_3$, 1,4-cyclohexylene, 1,4-cyclohexenylene or 1,4-cyclohexadienylene, in which -CH$_2$- may in each case be replaced once or twice, independently of one another, by -O- or -S- in such a way that heteroatoms are not linked directly, and which all may be monosubstituted or poly-substituted by halogen;

Z   is in each case, independently of one another, a single bond, a double bond, -CF$_2$O-, -OCF$_2$-, -CH$_2$CH$_2$-, -CF$_2$CF$_2$-, -CF$_2$-CH$_2$-, -CH$_2$-CF$_2$-, -CHF-CHF-, -C(O)O-, -OC(O)-, -CH$_2$O-, -OCH$_2$-, -CF=CH-, -CH=CF-, -CF=CF-, -CH=CH- or -C≡C-;

R   is hydrogen, an alkyl, alkoxy, alkenyl or alkynyl radical having from 1 to 15 or 2 to 15 carbon atoms respectively which is unsubstitu-ted, monosubstituted by -CF$_3$ or at least monosubstituted by halo-gen, where, in addition, one or more CH$_2$ groups in these radicals may each, independently of one another, be replaced by -O-, -S-, -CO-, -COO-, -OCO- or -OCO-O- in such a way that heteroatoms

are not linked directly, halogen, -CN, -SCN, -NCS, $-SF_5$, $-CF_3$, $-OCF_3$, $-OCHF_2$ or $-OCH_2F$;

X^1, X^{1a}, X^{1b}, X^2 and X^3 are each, independently of one another, hydrogen, an alkyl, alkoxy, alkenyl or alkynyl radical having from 1 to 15 or 2 to 15 carbon atoms respectively which is unsubstituted or at least monosubstituted by halogen, where, in addition, one or more CH_2 groups in these radicals may each, independently of one another, be replaced by -O-, -S-, -CO-, -COO-, -OCO- or -OCO-O- in such a way that heteroatoms are not linked directly, halogen, -CN, $-SF_5$, -SCN, -NCS, $-CF_3$, $-OCF_3$, $-OCHF_2$ or $-OCH_2F$;

E^1 and E^2 are each, independently of one another, hydrogen, an alkyl, alkoxy, alkenyl or alkynyl radical having from 1 to 15 or 2 to 15 carbon atoms respectively which is unsubstituted or at least mono-substituted by halogen, where, in addition, one or more CH_2 groups in these radicals may each, independently of one another, be replaced by -O-, -S-, -CO-, -COO-, -OCO- or -OCO-O- in such a way that heteroatoms are not linked directly, halogen, -CN, -SCN, -NCS, $-SF_5$, $-CF_3$, $-OCF_3$, $-OCHF_2$, $-OCH_2F$ or $-(Z-A-)_n-R$; and

n is 0, 1, 2 or 3;

where

in the formula I, ring B does not stand for the formula c if X^1, X^2 and X^3 are simultaneously hydrogen, and
in the formula I, ring B does not stand for the formula e if X^2 and X^3 are simultaneously fluorine or if E^1 is hydrogen and simultaneously X^1 and X^2 are fluorine.

Preference is given to cyclopenta[a]naphthalene derivatives of the general formulae I, III and V, and particular preference is given to cyclopenta[a]-naphthalene derivatives of the general formulae I and V.

The compounds all have negative $\Delta\varepsilon$ and are therefore suitable, in particular, for use in VA-TFT displays. The compounds according to the invention preferably have a $\Delta\varepsilon$ of < -2 and particularly preferably a $\Delta\varepsilon$ of < -5. The dielectric anisotropy of the compounds according to the invention enables satisfactorily low characteristic voltages to be achieved, in particular in VA-TFT displays. The compounds exhibit very good compatibility with the usual substances used in liquid-crystal mixtures for displays.

Furthermore, the compounds of the formulae I to V according to the invention have values for the optical anisotropy Δn which are particularly suitable for use in VA-TFT displays. The compounds according to the invention preferably have a Δn of greater than 0.02 and less than 0.20, particularly preferably less than 0.15.

The other physical, physicochemical or electro-optical parameters of the compounds according to the invention are also advantageous for use of the compounds in liquid-crystalline media. The compounds have, in particular, a sufficient breadth of the nematic phase and good low-temperature and long-term stability as well as sufficiently high clearing points and good viscosities and response times.

It is preferred for at least one of the radicals X^1, X^2 and X^3 or X^{1a}, X^{1b}, X^2 and X^3 on the naphthalene structure of the formula I, II, III, IV or V to be other than hydrogen.

It is furthermore preferred for ring B to have at least one electronegative substituent (-F or =O). These substituents on ring B are oriented in the same direction, i.e. the same side of the molecule, as the radicals X^1, X^{1a}, X^{1b}, X^2 and X^3.

The substituents X^1, X^{1a}, X^{1b}, X^2 and X^3, preferably CF_3, fluorine and/or chlorine substituents, in particular fluorine substituents, in the naphthalene structure and the electronegative atoms in ring B generate a dipole moment perpendicular to the longitudinal axis of the molecules, which can, if desired, be further strengthened by suitable substituents in the wing units

-(Z-A-)$_n$-R. In the field-free state, the compounds of the formulae I to V orient themselves with their longitudinal axis of the molecules perpendicular to the treated or coated glass surface of the display.

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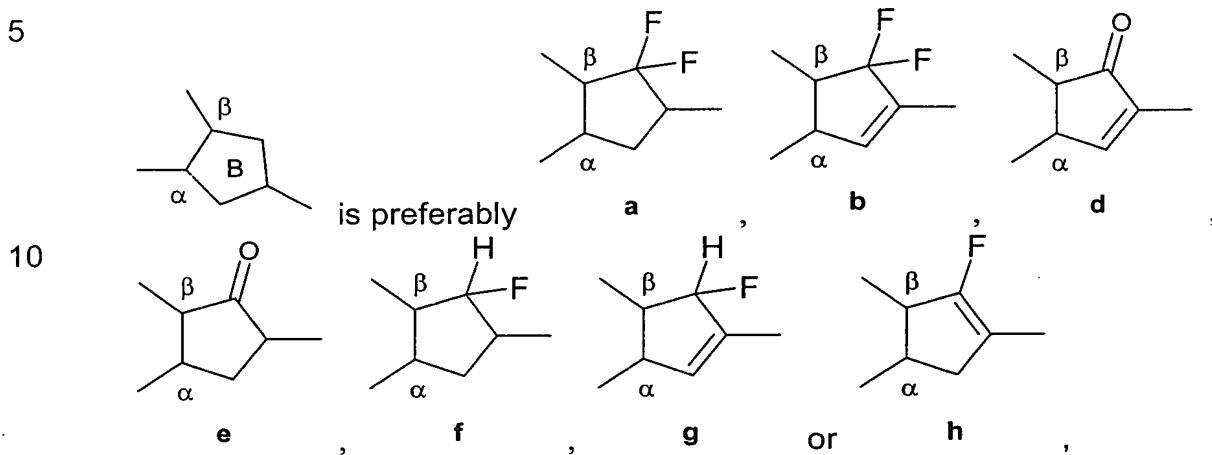
15 particularly preferably the fluorine-substituted rings **a**, **b**, **f**, **g** and **h**, in particular ring **a**.

In the general formulae I to V, A are preferably, independently of one another (i.e. if n > 1, so that a plurality of identical or different rings A are

20 present), optionally substituted 1,4-phenylene, optionally substituted 1,4-cyclohexylene, in which -CH$_2$- may be replaced once or twice by -O-, or optionally substituted 1,4-cyclohexenylene.

A are particularly preferably, independently of one another,

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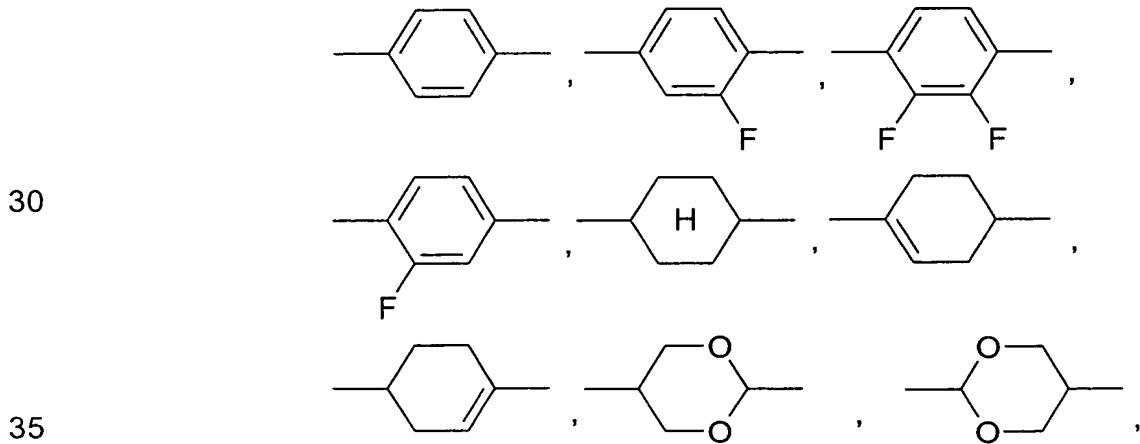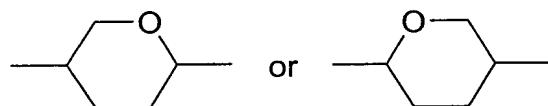
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A are very particularly preferably 1,4-cyclohexylene rings and/or optionally mono- or poly-fluorine-substituted 1,4-phenylene rings.

If E^1 and/or E^2 are $-(-Z-A-)_n-R$, A are preferably 1,4-cyclohexylene rings or optionally fluorine-substituted 1,4-phenylene rings.

Preferred groups Z in the compounds of the general formulae I to V are each, independently of one another, a single bond, $-CF_2O-$, $-OCF_2-$, $-CF_2CF_2-$, $-CH=CH-$, $-CF=CH-$, $-CH=CF-$ or $-CF=CF-$, particularly preferably a single bond, $-CF_2O-$, $-OCF_2-$, $-CF_2CF_2-$, $-CF=CH-$, $-CH=CF-$ or $-CF=CF-$. If E^1 and/or E^2 are $-(-Z-A-)_n-R$, Z is in particular in each case a single bond.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 in the general formulae I to V may each, independently of one another, be an alkyl radical – i.e. an aliphatic saturated hydrocarbon radical – and/or an alkoxy radical (alkyloxy radical) – i.e. an aliphatic saturated hydrocarbon radical having a terminal O atom – having from 1 to 15 carbon atoms, which is straight-chain or branched. It is preferably straight-chain, has 1, 2, 3, 4, 5, 6 or 7 carbon atoms and accordingly is preferably methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, methoxy, ethoxy, propoxy, butoxy, pentoxy, hexoxy or heptoxy.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may each, independently of one another, be oxaalkyl – i.e. one of the non-terminal CH_2 groups in the alkyl radical has been replaced by -O- – preferably straight-chain 2-oxapropyl (= methoxymethyl), 2- (= ethoxymethyl) or 3-oxabutyl (= methoxyethyl), 2-, 3- or 4-oxapentyl, 2-, 3-, 4- or 5-oxahexyl or 2-, 3-, 4-, 5- or 6-oxaheptyl. Correspondingly, R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may also, independently of one another, be thioalkyl radicals, i.e. alkyl radicals in which a CH_2 group has been replaced by -S-.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may furthermore each, independently of one another, be an alkenyl radical – i.e. an aliphatic hydrocarbon radical containing at least one C=C double bond – having from 2 to 15 carbon atoms, which is straight-chain or branched and contains at least one C-C double bond. It is preferably straight-chain and has from 2 to 7 carbon atoms. Accordingly, it is preferably vinyl, prop-1- or -2-enyl, but-1-, -2- or -3-enyl, pent-1-, -2-, -3- or -4-enyl, hex-1-, -2-, -3-, -4- or -5-enyl, or hept-1-, -2-, -3-, -4-, -5- or -6-enyl. If the two carbon atoms of the C-C double bond are substituted, the alkenyl radical may be in the form of the E- and/or Z-isomer (trans/cis). The respective E-isomers are generally preferred.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may also, independently of one another, be an alkynyl radical having from 2 to 15 carbon atoms, which is straight-chain or branched and contains at least one C-C triple bond.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may each, independently of one another, be an alkyl radical having from 1 to 15 carbon atoms in which one CH_2 group has been replaced by -O- and one has been replaced by -CO-, these preferably being adjacent. This thus contains an acyloxy group -CO-O- or an oxycarbonyl group -O-CO-. This radical is preferably straight-chain and has from 2 to 6 carbon atoms. Replacement of a CH_2 group by -CO- with formation of a keto group is also possible. The corresponding radical likewise preferably has from 2 to 6 carbon atoms.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may each, independently of one another, be an alkyl radical having from 1 to 15 carbon atoms in which one CH_2 group has been replaced by unsubstituted or substituted -CH=CH- and an adjacent CH_2 group has been replaced by CO or CO-O or O-CO, where this may be straight-chain or branched. The radical is preferably straight-chain and has from 4 to 13 carbon atoms.

R, E^1 and E^2 may each, independently of one another, be an alkyl radical having from 1 to 15 carbon atoms or alkenyl radical having from 2 to 15 carbon atoms, each of which is monosubstituted by -CN or -CF_3, these

preferably being straight-chain. Substitution by -CN or $-CF_3$ is possible in any desired position.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may each, independently of one another, be an alkyl radical in which two or more CH_2 groups have been replaced by -O- and/or -CO-O-, where this may be straight-chain or branched. It is preferably branched and has from 3 to 12 carbon atoms.

R, E^1, E^2, X^1, X^{1a}, X^{1b}, X^2 and X^3 may each, independently of one another, be an alkyl radical or alkoxy radical having from 1 to 15 carbon atoms or alkenyl radical having from 2 to 15 carbon atoms, each of which is at least monosubstituted by halogen, where these radicals are preferably straight-chain and halogen is preferably -F or -Cl. In the case of polysubstitution, halogen is preferably -F. The resultant radicals also include perfluorinated radicals, such as $-CF_3$ and $-OCF_3$. In the case of monosubstitution, the fluorine or chlorine substituent can be in any desired position, but is preferably in the ω-position.

R in the general formulae I to V is particularly preferably an alkyl radical, alkoxy radical or alkenyl radical having from 1 to 7 or 2 to 7 carbon atoms respectively.

E^1 and E^2 in the general formulae I to V are preferably, independently of one another, hydrogen, an alkyl radical, alkoxy radical or alkenyl radical having from 1 to 7 or 2 to 7 carbon atoms respectively, a halogen or $-(-Z-A-)_n-R$, in which n is 1, Z is a single bond, A is 1,4-cyclohexylene or optionally fluorine-substituted 1,4-phenylene, and R is alkyl, alkoxy or alkenyl having from 1 to 7 or 2 to 7 carbon atoms respectively, particularly preferably hydrogen, an alkyl radical or alkoxy radical having from 1 to 7 carbon atoms, fluorine, chlorine, 4-alkyl-substituted 1,4-phenylene or 4-alkyl-substituted 1,4-cyclohexylene, and in particular fluorine.

X^1, X^{1a}, X^{1b}, X^2 and X^3 in the general formulae I to V are preferably, independently of one another, hydrogen, an alkyl radical, alkoxy radical or alkenyl radical having from 1 to 7 or 2 to 7 carbon atoms respectively

which is at least monosubstituted by halogen, or a halogen. It is particularly preferred here for at least one of X^1, X^2 and X^3 or X^{1a}, X^{1b}, X^2 and X^3 to be -CF_3, F or Cl. Very particularly preferably, all of X^1, X^2 and X^3 or X^{1a}, X^{1b}, X^2 and X^3 are -CF_3, fluorine or chlorine, and in particular all are fluorine.

Preferred compounds of the general formulae I to V contain a total of zero, one or two wing units ZA, i.e. n = 0, 1 or 2. If a wing group ZA is present (n = 1), it can be bonded to the cyclopentane ring or to the naphthalene structure (E^1, E^2 = -Z-A-R). If n is 2 or 3, the two or three wing groups ZA may be bonded to only one side of the molecule – to the cyclopentane ring or as E^1 or E^2 to the naphthalene structure – or alternatively to both sides of the molecule – to the cyclopentane ring and as E^1 or E^2 to the naphthalene structure. n is particularly preferably 0 or 1.

In connection with the present invention, halogen is fluorine, chlorine, bromine or iodine.

The compounds of the general formulae I to V are prepared by methods known per se, as described in the literature (for example in the standard works, such as Houben-Weyl, Methoden der organischen Chemie [Methods of Organic Chemistry], Georg-Thieme-Verlag, Stuttgart), to be precise under reaction conditions which are known and suitable for the said reactions. Use can be made here of variants which are known per se, but are not mentioned here in greater detail.

If desired, the starting materials can also be formed in situ by not isolating them from the reaction mixture, but instead immediately converting them further into the compounds of the general formulae I to V.

The syntheses of various polysubstituted naphthalene derivatives which are used to build up the five-membered ring are described by way of example in the examples. The starting substances are obtainable by generally accessible literature procedures or are commercially available. The reactions described should likewise be regarded as known from the literature.

An illustrative synthesis for building up the five-membered ring is shown below. The synthesis can be adapted to the particular desired compounds of the general formulae I to V through the choice of suitable starting materials.

A   B   C

D   E

F   G

H

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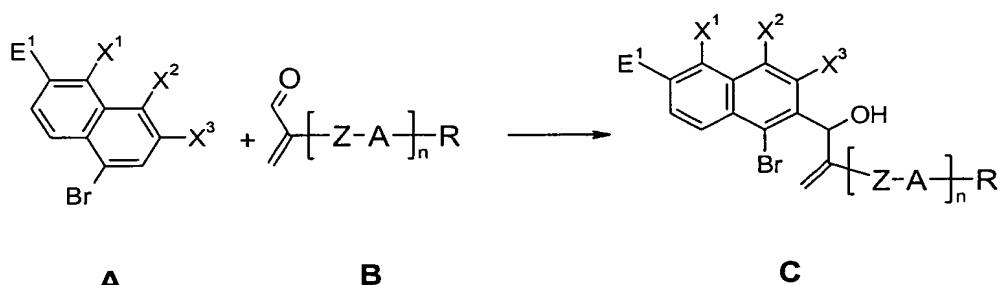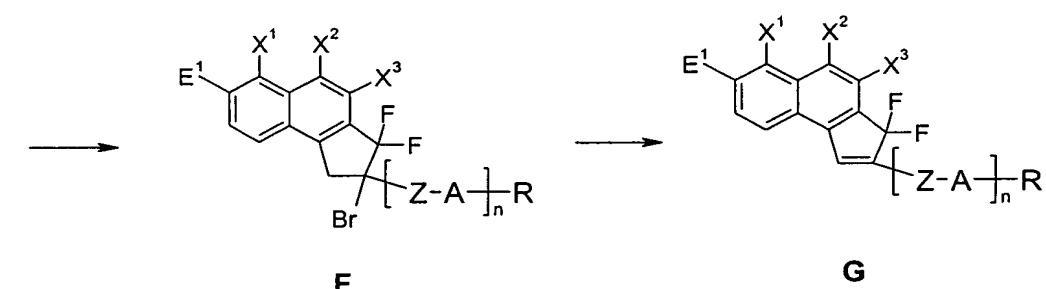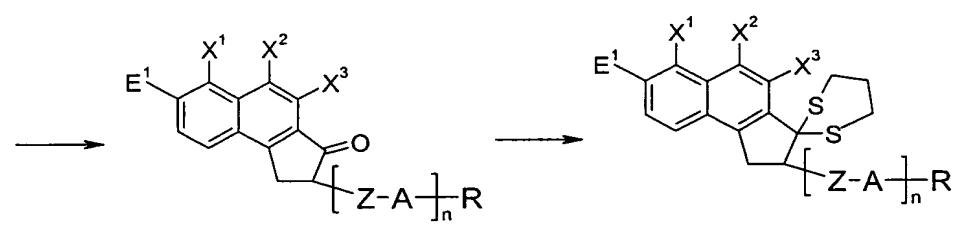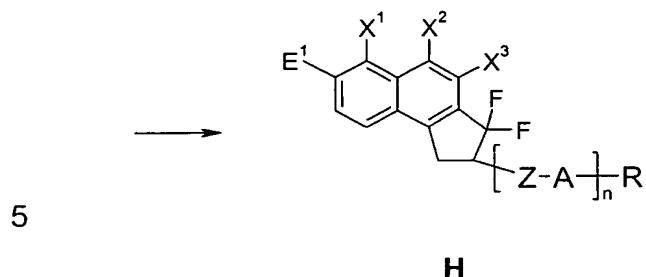
10   Starting from the 4-bromonaphthalene derivative **A**, reaction with an α,β-unsaturated aldehyde **B** in the presence of lithium diisopropylamide (LDA) gives compound **C**. This reacts with palladium catalysis in the presence of triethylamine with ring closure to give the ketone **D** (= compound Ie). Starting from the ketone **D** and 1,3-propanedithiol in the presence of BF$_3$/diethyl ether, the corresponding dithiane **E** is obtained. This is reacted with 1,3-dibromo-5,5-dimethylhydantoin (DBH) and HF in pyridine to give

15   the cyclopenta[a]naphthalene derivative **F**. Elimination of HBr in the presence of diazabicycloundecene (DBU) gives the cyclopenta[a]naphthalene derivative **G** (= compound Ib). The cyclopenta[a]naphthalene derivative **G** is hydrogenated on a palladium/carbon catalyst in a hydrogen atmosphere to give the cyclopenta[a]naphthalene derivative **H** (= compound Ia).

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D   **J**

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30   **J** $\longrightarrow$

K

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J $\longrightarrow$

L

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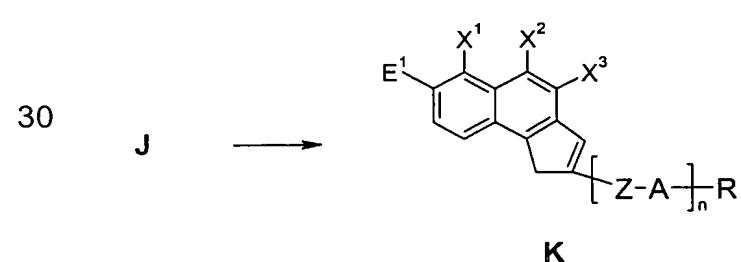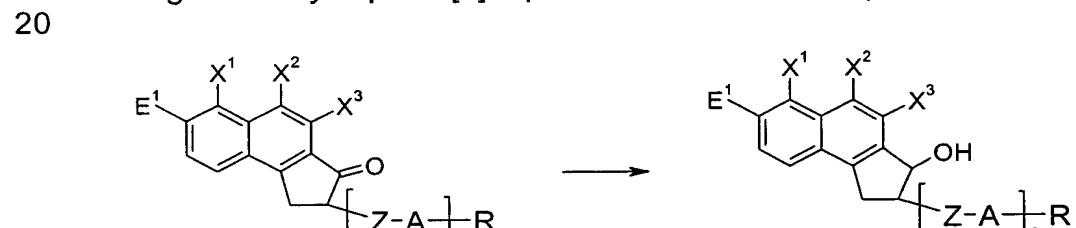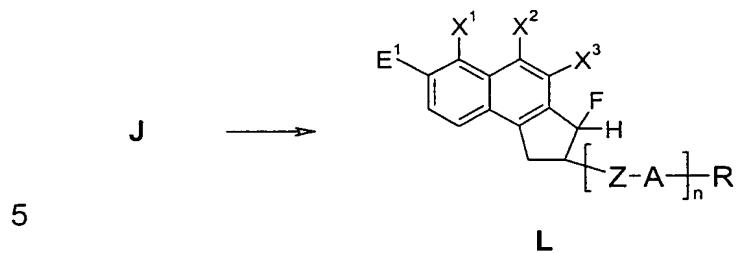
Starting from the ketone **D** (which, in addition, can also be prepared
analogously to US 2003/0108684 A1, scheme 4), reduction, for example
using LiAlH$_4$, firstly gives access to the alcohol **J**, from which on the one
hand the cyclopenta[a]naphthalene derivative **K** (= compound Ii) is acces-
sible by subsequent elimination using acid and on the other hand the
cyclopenta[a]naphthalene derivative **L** (= compound If) is accessible using
DAST (diaminosulfur trifluoride; cf. M. Hudlicky, Organic Reactions, 35,
1988, 513) analogously to DE 44 34 975 A1.

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D $\longrightarrow$ M

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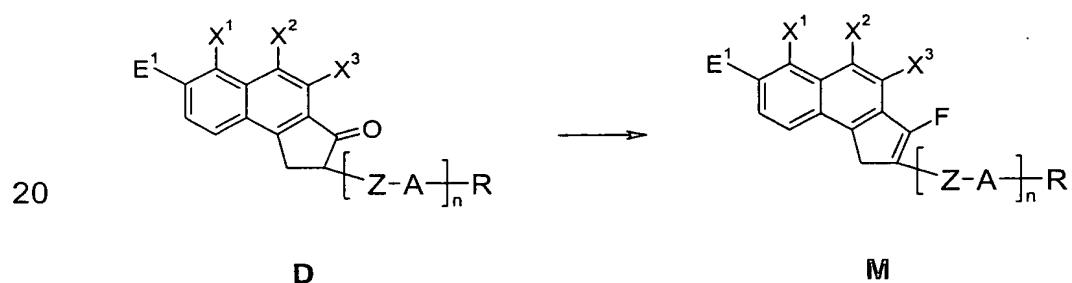
Starting from the ketone **D**, the cyclopenta[a]naphthalene derivative **M** (=
compound Ih) is furthermore accessible by reaction with DAST analog-
ously to the process disclosed in DE 44 34 975 A1.

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The reactions described should only be regarded as illustrative. The per-
son skilled in the art can carry out corresponding variations of the synthe-
ses described and also follow other suitable synthetic routes in order to
obtain compounds of the formulae I to V.

30

As already mentioned, the compounds of the general formulae I to V can
be used in liquid-crystalline media.

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- 18 -

The present invention therefore also relates to a liquid-crystalline medium comprising at least two liquid-crystalline compounds, comprising at least one compound of the general formulae I to V.

5   The present invention also relates to liquid-crystalline media comprising from 2 to 40, preferably from 4 to 30, components as further constituents besides one or more compounds of the formulae I, II, III, IV and/or V according to the invention. These media particularly preferably comprise from 7 to 25 components besides one or more compounds according to the invention.

10   These further constituents are preferably selected from nematic or nemato-genic (monotropic or isotropic) substances, in particular substances from the classes of the azoxybenzenes, benzylideneanilines, biphenyls, terphenyls, phenyl or cyclohexyl benzoates, phenyl or cyclohexyl esters of cyclohexane-carboxylic acid, phenyl or cyclohexyl esters of cyclohexylbenzoic acid,

15   phenyl or cyclohexyl esters of cyclohexylcyclohexanecarboxylic acid, cyclo-hexylphenyl esters of benzoic acid, of cyclohexanecarboxylic acid or of cyclohexylcyclohexanecarboxylic acid, phenylcyclohexanes, cyclo-hexylbiphenyls, phenylcyclohexylcyclohexanes, cyclohexylcyclohexanes, cyclohexylcyclohexylcyclohexenes, 1,4-biscyclohexylbenzenes, 4',4'-

20   biscyclohexylbiphenyls, phenyl- or cyclohexylpyrimidines, phenyl- or cyclo-hexylpyridines, phenyl- or cyclohexyldioxanes, phenyl- or cyclohexyl-1,3-dithianes, 1,2-diphenylethanes, 1,2-dicyclohexylethanes, 1-phenyl-2-cyclo-hexylethanes, 1-cyclohexyl-2-(4-phenylcyclohexyl)ethanes, 1-cyclohexyl-2-biphenylylethanes, 1-phenyl-2-cyclohexylphenylethanes, optionally halogen-

25   ated stilbenes, benzyl phenyl ethers, tolans and substituted cinnamic acids, as well as corresponding compounds in which two carbocyclic and/or heterocyclic rings or ring systems (for example cyclohexyls, phenyls, dioxanes, tetrahydropyrans) are linked via a difluorooxymethylene bridge ($-CF_2O-$). The 1,4-phenylene groups in these compounds may also be

30   mono- or polyfluorinated.

The most important compounds suitable as further constituents of media according to the invention can be characterised by the formulae (VI), (VII), (VIII), (IX) and (X):

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R'-L-E-R"	(VI)
R'-L-COO-E-R"	(VII)
R'-L-OOC-E-R"	(VIII)
R'-L-CH$_2$CH$_2$-E-R"	(IX)
R'-L-CF$_2$O-E-R"	(X)

5

In the formulae (VI), (VII), (VIII), (IX) and (X), L and E, which may be identical or different, are each, independently of one another, a divalent radical from the group formed by -Phe-, -Cyc-, -Phe-Phe-, -Phe-Cyc-, -Cyc-Cyc-,

10   -Pyr-, -Dio-, -Thp-, -G-Phe- and -G-Cyc- and their mirror images, where Phe is unsubstituted or fluorine-substituted 1,4-phenylene, Cyc is trans-1,4-cyclohexylene or 1,4-cyclohexylene, Pyr is pyrimidine-2,5-diyl or pyridine-2,5-diyl, Dio is 1,3-dioxane-2,5-diyl, Thp- is tetrahydropyran-2,5-diyl and G is 2-(trans-1,4-cyclohexyl)ethyl, pyrimidine-2,5-diyl, pyridine-2,5-diyl or 1,3-

15   dioxane-2,5-diyl.

One of the radicals L and E is preferably Cyc or Phe. E is preferably Cyc, Phe or Phe-Cyc. The media according to the invention preferably comprise one or more components selected from the compounds of the formulae (VI),

20   (VII), (VIII), (IX) and (X) in which L and E are selected from the group consisting of Cyc and Phe and simultaneously one or more components selected from the compounds of the formulae (VI), (VII), (VIII), (IX) and (X) in which one of the radicals L and E is selected from the group consisting of Cyc and Phe and the other radical is selected from the group consisting of

25   -Phe-Phe-, -Phe-Cyc-, -Cyc-Cyc-, -G-Phe- and -G-Cyc-, and optionally one or more components selected from the compounds of the formulae (VI), (VII), (VIII), (IX) and (X) in which the radicals L and E are selected from the group consisting of -Phe-Cyc-, -Cyc-Cyc-, -G-Phe- and -G-Cyc-.

30   In a smaller sub-group of the compounds of the formulae (VI), (VII), (VIII), (IX) and (X), R' and R" are each, independently of one another, alkyl; alkenyl, alkoxy, alkoxyalkyl (oxaalkyl), alkenyloxy or alkanoyloxy having up to 8 carbon atoms. This smaller sub-group is called group A below, and the compounds are referred to by the sub-formulae (VIa), (VIIa), (VIIIa), (IXa)

35   and (Xa). In most of these compounds, R' and R" are different from one

another, one of these radicals usually being alkyl, alkenyl, alkoxy or alkoxy-alkyl (oxaalkyl).

5   In another smaller sub-group of the compounds of the formulae (VI), (VII), (VIII), (IX) and (X), which is known as group B, E is
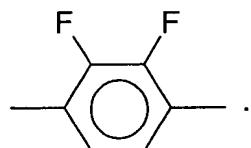
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In the compounds of group B, which are referred to by the sub-formulae (VIb), (VIIb), (VIIIb), (IXb) and (Xb), R' and R" are as defined for the compounds of the sub-formulae (VIa) to (Xa) and are preferably alkyl, alkenyl, alkoxy or alkoxyalkyl (oxaalkyl).

15

In a further smaller sub-group of the compounds of the formulae (VI), (VII), (VIII), (IX) and (X), R" is -CN. This sub-group is referred to below as group C, and the compounds of this sub-group are correspondingly described by sub-formulae (VIc), (VIIc), (VIIIc), (IXc) and (Xc). In the compounds of the sub-formulae (VIc), (VIIc), (VIIIc), (IXc) and (Xc), R' is as defined for the compounds of the sub-formulae (VIa) to (Xa) and is preferably alkyl, alkenyl, alkoxy or alkoxyalkyl (oxaalkyl).

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25   Besides the preferred compounds of groups A, B and C, other compounds of the formulae (VI), (VII), (VIII), (IX) and (X) having other variants of the proposed substituents are also customary. All these substances are obtainable by methods which are known from the literature or analogously thereto.

30   Besides the compounds of the general formulae I, II, III, IV and/or V according to the invention, the media according to the invention preferably comprise one or more compounds from groups A, B and/or C. The proportions by weight of the compounds from these groups in the media according to the invention are:

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group A: from 0 to 90%, preferably from 20 to 90%, in particular from 30 to 90%

group B: from 0 to 80%, preferably from 10 to 80%, in particular from 10 to 70%

group C: from 0 to 80%, preferably from 5 to 80%, in particular from 5 to 50%.

The media according to the invention preferably comprise from 1 to 40%, particularly preferably from 5 to 30%, of the compounds of the formulae I, II, III, IV and/or V according to the invention. Preference is furthermore given to media comprising more than 40%, in particular from 45 to 90%, of compounds of the formulae I, II, III, IV and/or V according to the invention. The media preferably comprise one, two, three, four or five compounds of the formulae I, II, III, IV and/or V according to the invention.

Examples of the compounds of the formulae (VI), (VII), (VIII), (IX) and (X) are the compounds listed below:

R^1—[H]—[H]—COO—[O]—R^2

5 R^1—[H]—COO—[O]—R^2

10 R^1—[H]—[H]—C_2H_4—[O]—R^2

R^1—[H]—C_2H_4—[H]—[O]—R^2

15 R^1—[H]—C_2H_4—[O]—R^2

20 R^1—[H]—[O]—COO—[O]—R^2

25 R^1—[O]—COO—[O]—R^2

L^1 L^2

30 R^1—[H]—[O]—R^2

R^1—[dioxane]—[O]—R^2

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R^1—⬡H—C_2H_4—⬡O—⬡O—R^2

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R^1—⬡H—⬡O—C_2H_4—⬡O(L^1, L^2)—R^2

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R^1—⬡H—⬡O—⬡H—R^2

R^1—⬡H—⬡H—C_2H_4—⬡O—⬡O—R^2

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R^1—⬡H—⬡H—⬡O—⬡O(L^1, L^2)—R^2

R^1—⬡O—⬡O(L^1, L^2)—R^2

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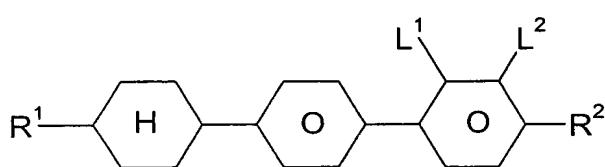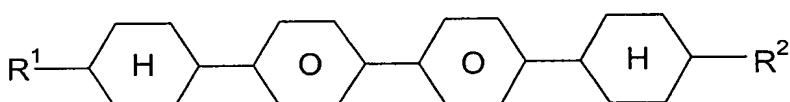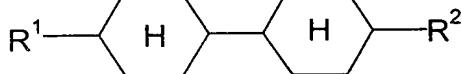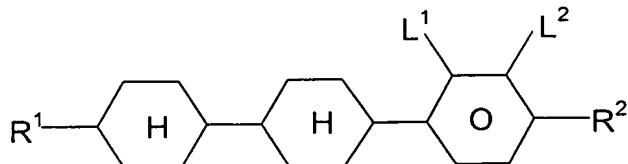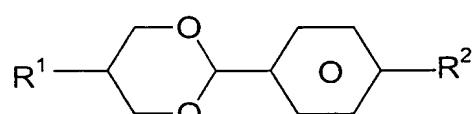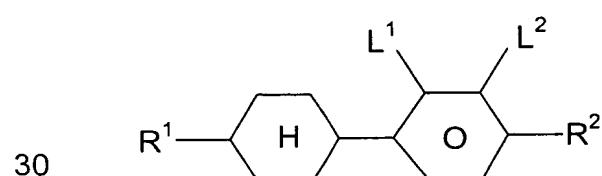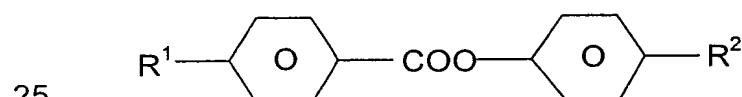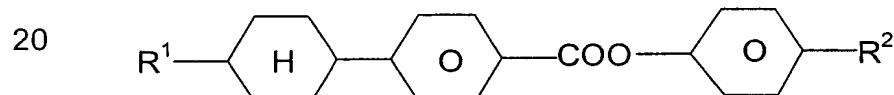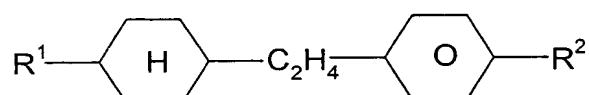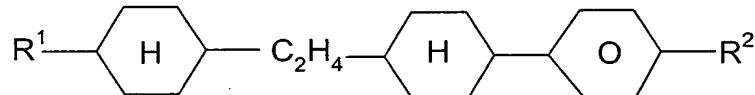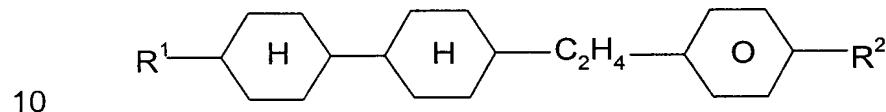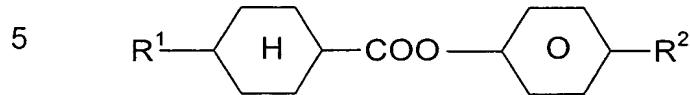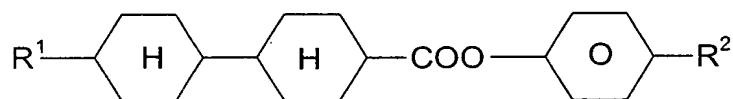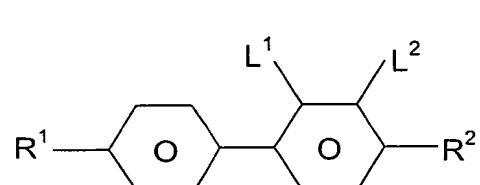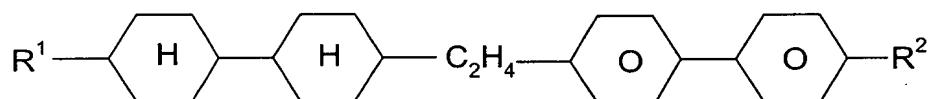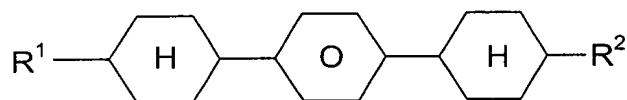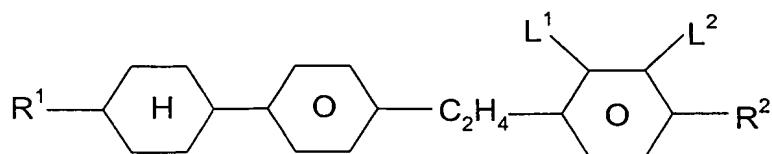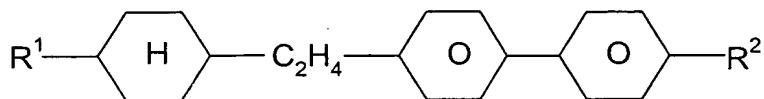
where R^1 and R^2, independently of one another, are -C_nH_{2n+1} or -OC_nH_{2n+1}, and n = 1, 2, 3, 4, 5, 6, 7 or 8, and L^1 and L^2, independently of one another, are -H or -F,

30

C_nH_{2n+1}—⬡H—C_2H_4—⬡O—⬡O(F)—C_mH_{2m+1}

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C_nH_{2n+1} —[H]— [O] —[O]— [H]— C_mH_{2m+1}

F

5

C_nH_{2n+1} —[H]— [H] —COO— [O]— [H]— C_mH_{2m+1}

10

C_nH_{2n+1} —[H]— C_2H_4 —[O]— [O]— [H]— C_mH_{2m+1}

C_nH_{2n+1} —[H]— C_2H_4 —[H]— C_mH_{2m+1}

15

C_nH_{2n+1} —[H]— [H] —CH_2O-C_mH_{2m+1}

20

F   F

C_nH_{2n+1} —[H]— [O] —[O]— C_mH_{2m+1}

25

F

C_nH_{2n+1} —[H]— [H] —[O]— [O]— C_mH_{2m+1}

30

F   F

C_nH_{2n+1} —[H]— [H] —[O]— [O]— C_mH_{2m+1}

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$$C_nH_{2n+1}\!-\!\langle H \rangle\!-\!\langle H \rangle\!-\!CH_2CH_2\!-\!\langle H \rangle\!-\!\langle O \rangle\!-\!C_mH_{2m+1}$$

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$$C_nH_{2n+1}\!-\!\langle H \rangle\!-\!\langle H \rangle\!-\!\langle O \rangle\!-\!OC_mH_{2m+1}$$

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$$C_nH_{2n+1}\!-\!\langle H \rangle\!-\!\langle O \rangle\!-\!\langle O \rangle\!-\!C_mH_{2m+1}$$
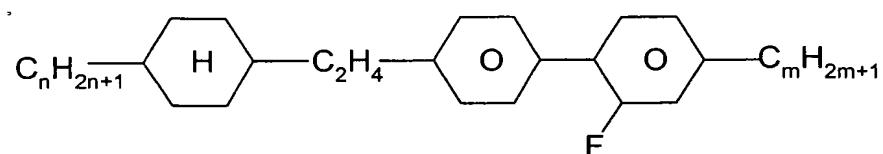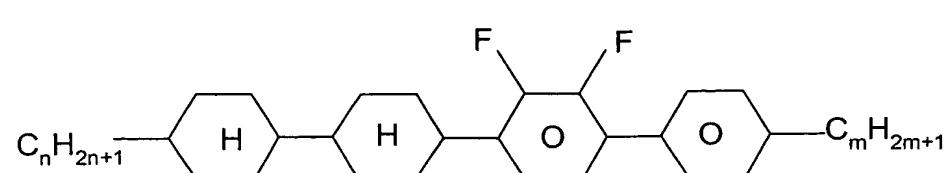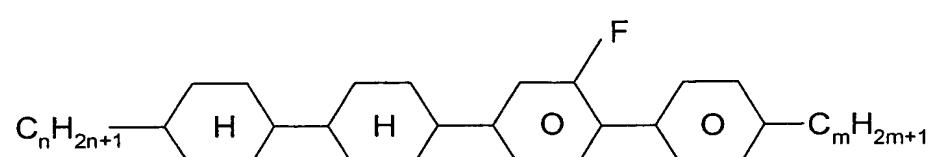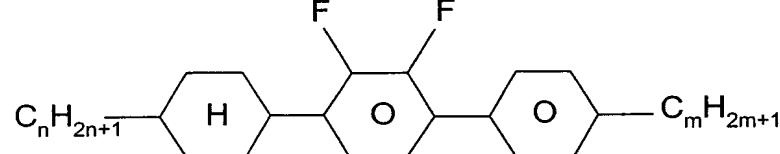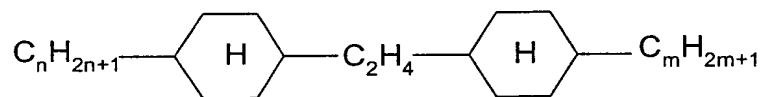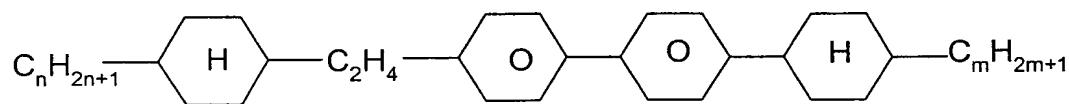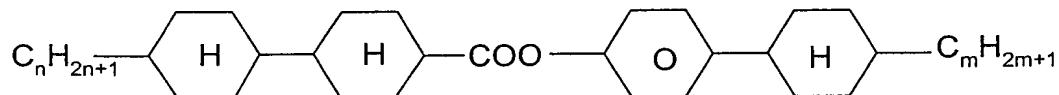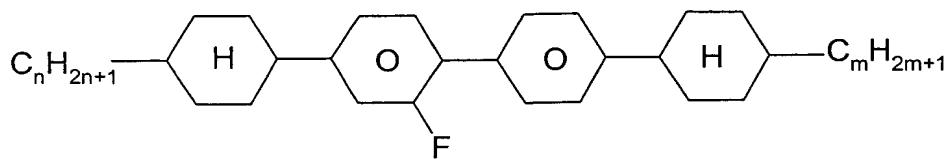
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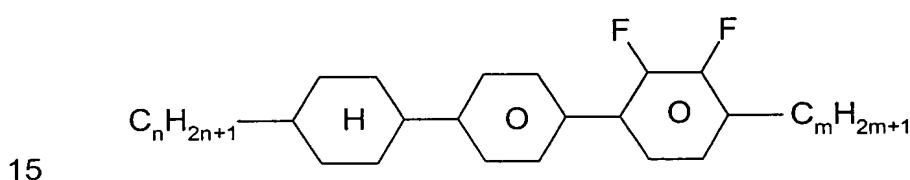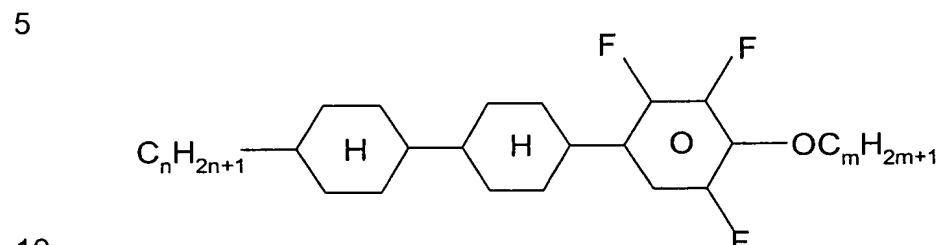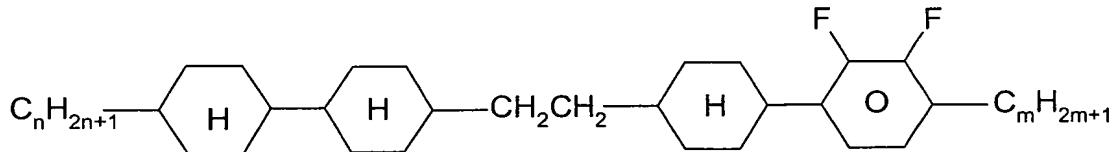
where m and n, independently of one another, are 1, 2, 3, 4, 5, 6, 7 or 8.

20 The media according to the invention are prepared in a manner conventional per se. In general, the components are dissolved in one another, advantageously at elevated temperature. By means of suitable additives, the liquid-crystalline phases of the present invention can be modified in such a way that they can be used in all types of liquid-crystal display element that have been disclosed hitherto. Additives of this type are known to
25 the person skilled in the art and are described in detail in the literature (H. Kelker/R. Hatz, Handbook of Liquid Crystals, Verlag Chemie, Weinheim, 1980). For example, pleochroic dyes can be used for the preparation of coloured guest-host systems or substances can be added in order to modify the dielectric anisotropy, the viscosity and/or the alignment of the nema-
30 tic phases.

Owing to their negative $\Delta\varepsilon$, the compounds of the formulae I to V are particularly suitable for use in VA-TFT displays.

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The present invention therefore also relates to electro-optical liquid-crystal display elements containing a liquid-crystalline medium according to the invention.

5   The invention is explained in greater detail below with reference to working examples, but without being restricted thereby.

Examples

10   The starting substances can be obtained by generally accessible literature procedures or are commercially available. The reactions described are known from the literature.

<u>Example 1</u>

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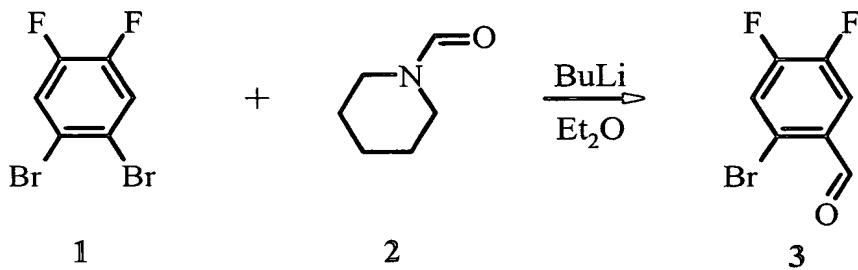
38.8 ml (95.0 mmol) of a 2.5M butyllithium solution in hexane were added at -75°C to a solution of 25.0 g (92.0 mmol) of the aromatic compound **1** in 25   200 ml of diethyl ether, and the mixture was stirred for 1 hour. 13.4 ml (120 mmol) of formylpiperidine (**2**) in 15 ml of diethyl ether were subsequently added at T < -55°C. After a further hour, the batch was warmed to room temperature, water was added, and the mixture was acidified. Extraction, drying, evaporation and chromatography on silica gel gave 30   14.2 g (70%) of the aldehyde **3**.

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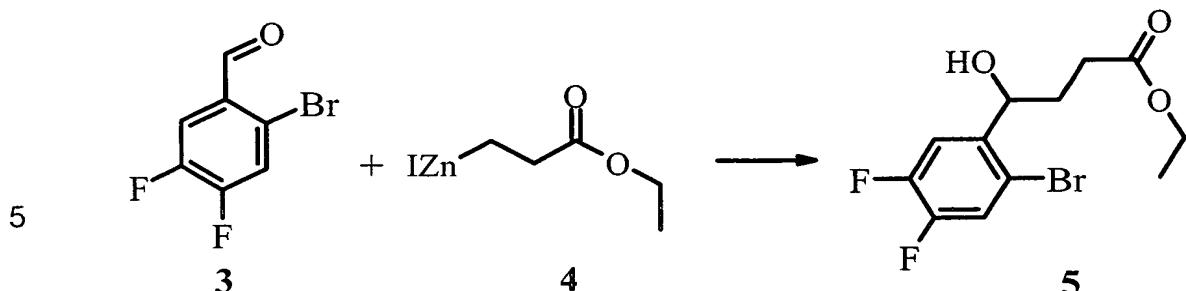
200 ml (100 mmol) of a 0.5M solution of the zinc compound **4** in THF were
added at -75°C to a solution of 26.8 g (98.5 mmol) of the aldehyde **3** in
100 ml of THF. After 30 minutes, the cooling was removed. Water was
added to the thawed batch, which was then acidified using 1N HCl solution
and extracted with methyl tert-butyl ether. Drying, evaporation and chroma-
tography on silica gel gave 28.6 g (90%) of the hydroxy ester **5**.

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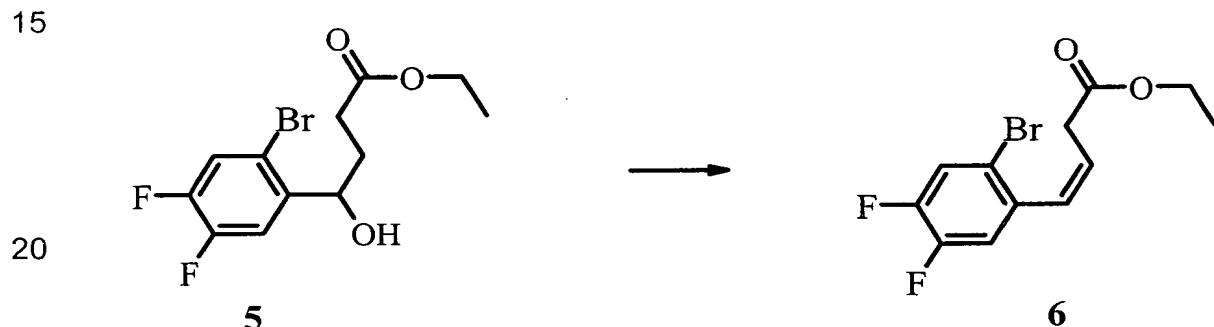
20.0 g (61.9 mmol) of the hydroxy ester **5** were dissolved in 200 ml of tolu-
ene, 1 g of p-toluenesulfonic acid was added, and the mixture was refluxed
until the water separation was complete. Evaporation and filtration through
silica gel gave 16.4 g (87%) of the ester **6**.

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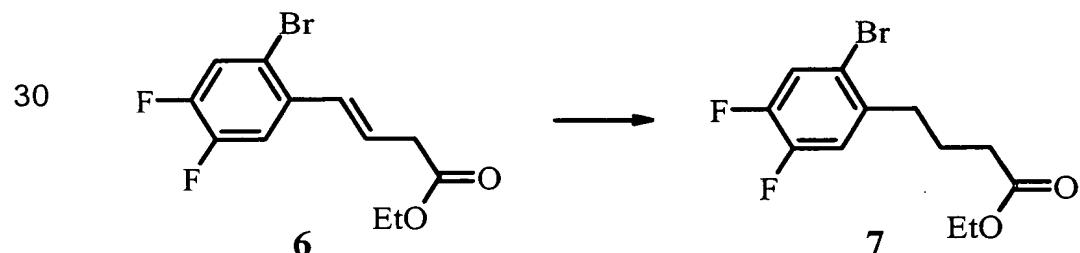
15.0 g (49.2 mmol) of the unsaturated ester **6** were hydrogenated on a

palladium catalyst (5%/C) in tetrahydrofuran (THF). Yield: 14.5 g (96%) of the ester **7**.

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7   8
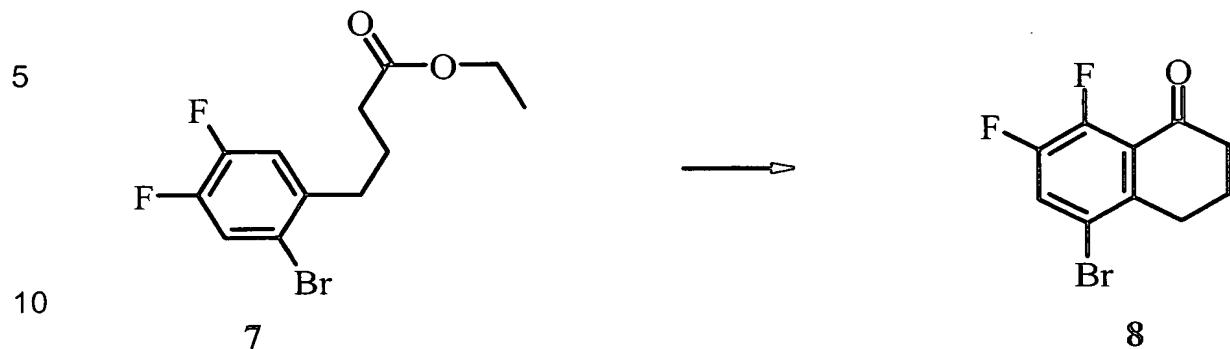
9.0 g (29.3 mmol) of the ester **7** were added at 60°C to 100 g of polyphos-phoric acid. The temperature was subsequently increased to 120°C for

15   4 hours. After cooling, the batch was added to ice and extracted with methyl tert-butyl ether. Drying, evaporation and crystallisation gave 4.8 g (63%) of the ketone **8**.

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8   9

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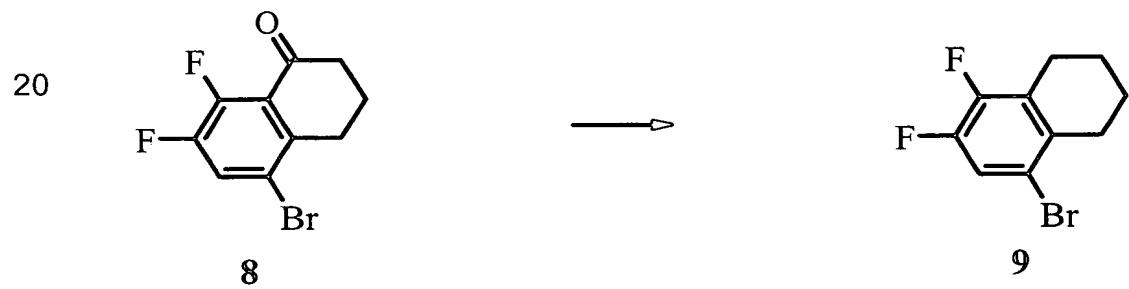
5.0 g (19.2 mmol) of the oxo compound **8** were dissolved in 40 ml of diethylene glycol dimethyl ether, and 2.3 g (58.5 mmol) of sodium boro-hydride were added with ice-cooling. 9 ml of boron trifluoride/diethyl ether complex were subsequently added. After 2 hours at room temp., the batch

30   was added to sat. sodium hydrogencarbonate solution. The aqueous phase was extracted with dichloromethane. Drying, evaporation and chro-matography on silica gel gave 4.3 g (90%) of the tetrahydronaphthalene **9**.

Compounds according to the invention are accessible from compounds

35   **8** and **9** or analogous compounds, as is evident to the person skilled in the

art, inter alia from the description and the further examples.

Example 2

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5 → **10**
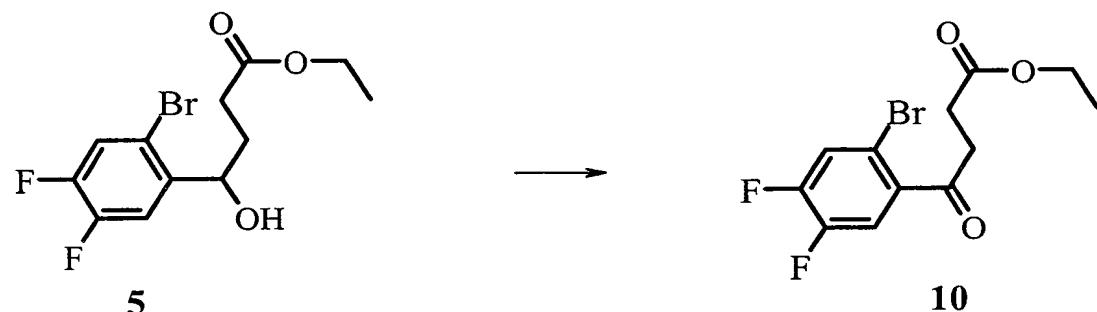
A solution of 10.6 g (32.7 mmol) of the hydroxy ester **5** was added at room temp. to a suspension of 40.0 mmol of PCC on 50 g of Celite® in 150 ml of dichloromethane. When the reaction was complete (TLC), the batch was filtered, and the filter cake was washed with methylene chloride. Evaporation and chromatography on silica gel gave 10.1 g (96%) of the oxo ester **10**.

10 → **11**
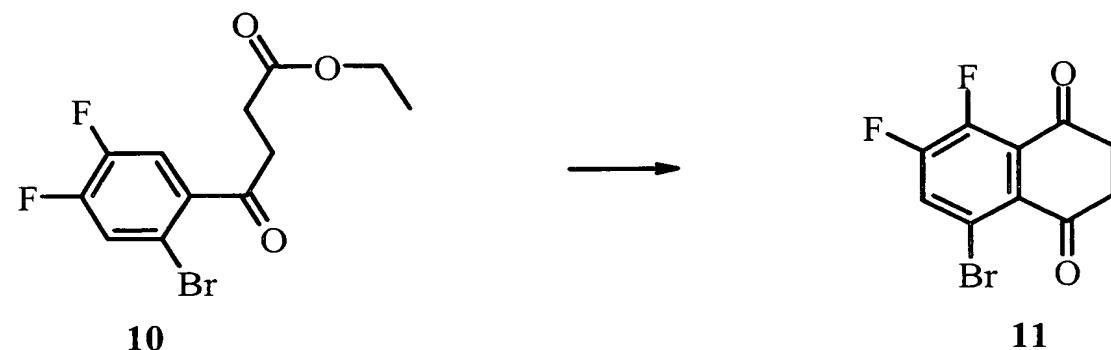
The ring closure was carried out as described above for compound **7**. Yield: 61%.

35

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11 → **12**
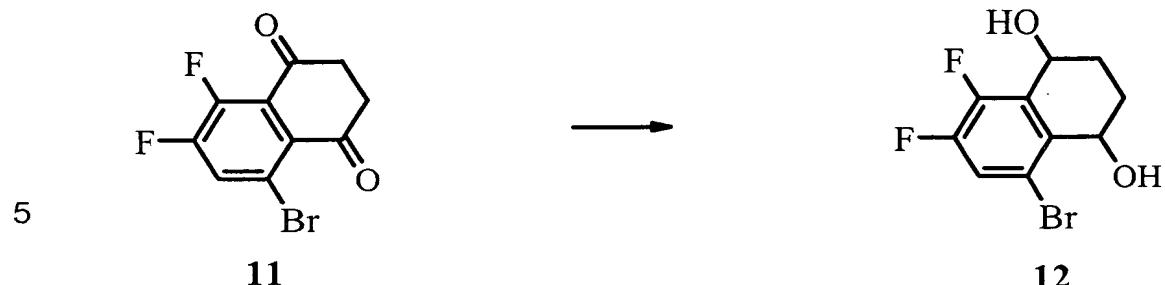
8.6 g (31.1 mmol) of the dione **11** were dissolved in 150 ml of ethanol, and 2.4 g (65.0 mmol) of sodium borohydride were added in portions. When the reaction was complete (TLC), the batch was hydrolysed using water, the ethanol was removed under reduced pressure, and the residue was taken up in water and extracted with toluene. After evaporation, the product **12** was employed in the next step without further purification.

15

12 → **13**
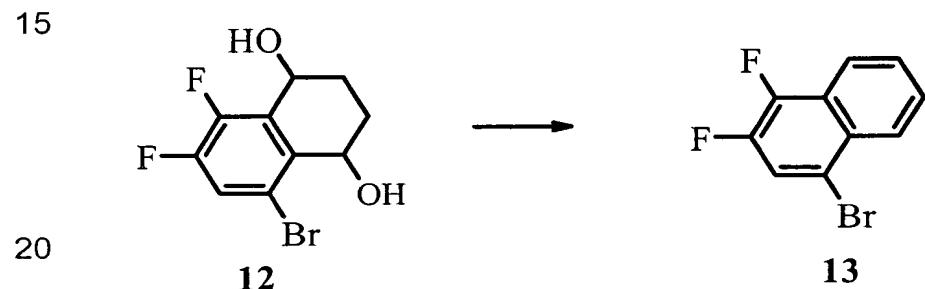
10.0 g of the crude diol **12** were dissolved in 200 ml of toluene, 1 g of p-toluenesulfonic acid was added, and the mixture was refluxed until the water separation was complete. Evaporation and filtration through silica gel gave 8.0 g (92%) of the naphthalene **13**. Compounds according to the invention are accessible therefrom (or from analogous compounds), as is evident to the person skilled in the art, inter alia from the description and the further examples.

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Example 3
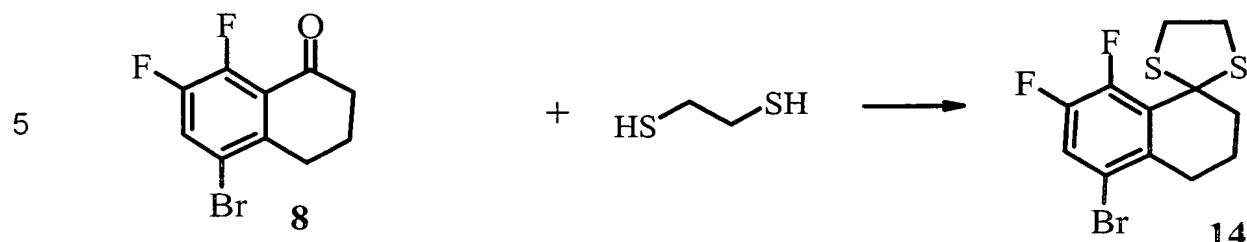
30 ml of boron trifluoride/diethyl ether complex were added under nitrogen to a solution of 13.1 g (50.0 mmol) of the ketone **8** and 8.4 ml (100 mmol) of the dithiol in 150 ml of dichloromethane, and the mixture was stirred overnight. The batch was added slowly to sat. sodium hydrogencarbonate solution and deacidified. Drying, evaporation and chromatography on silica gel gave 17.2 g (92%) of the protected ketone **14**.
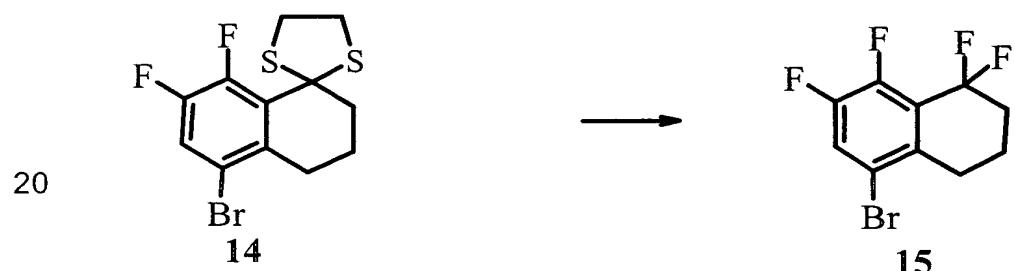
A solution of 9.3 g (25.0 mmol) of the dithiolane **14** in 60 ml of dichloro-methane was added at -75°C to a suspension of 30.2 g (105.2 mmol) of 1,3-dibromo-5,5-dimethylhydantoin in 60 ml of dichloromethane and 120 ml of a 65% solution of hydrogen fluoride in pyridine. The batch was slowly warmed to 0°C over the course of 3 hours and added to 1500 ml of ice-cooled 2N sodium hydroxide solution to which 120 ml of 39% sodium hydrogensulfite solution had been added. The pH was adjusted to 8, and the aqueous phase was extracted with methylene chloride. Drying, evapo-ration and chromatography on silica gel gave 5.2 g (73%) of the fluorinated aromatic compound **15**. Compounds according to the invention are accessible therefrom (or from analogous compounds), as is evident to the

person skilled in the art, inter alia from the description and the further examples.

5   Example 4
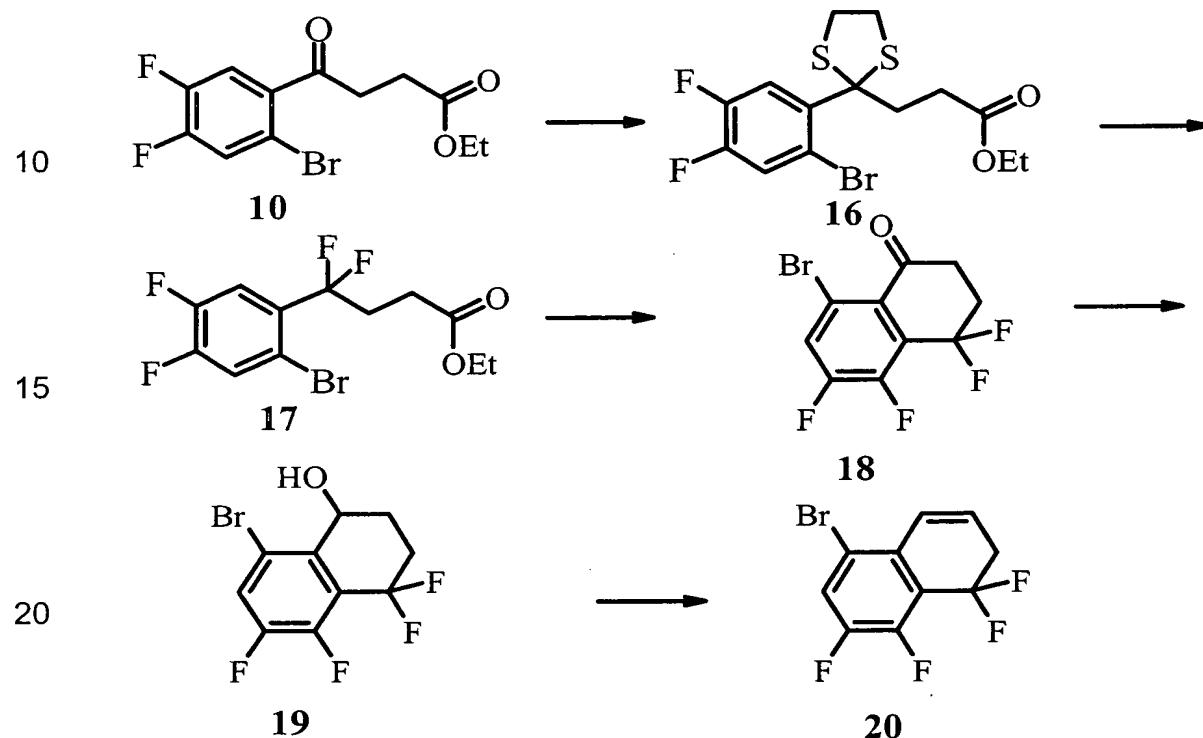
25   The synthesis is carried out in accordance with the reactions described above, with the elimination of water from **19** to give **20** likewise being effected using p-toluenesulfonic acid. Overall yield: 30%.

Example 5

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15   22
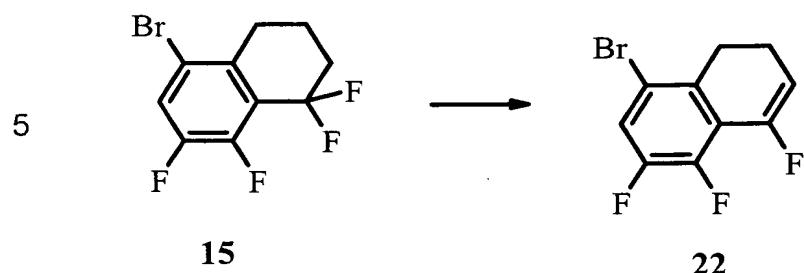
10   A solution of 9.0 g (23.6 mmol) of **15** in 50 ml of THF was slowly added to
a suspension of 4.5 g (40.1 mmol) of potassium tert-butoxide in 50 ml of
THF, and the mixture was subsequently refluxed overnight. The cooled
batch was diluted with water and extracted with diethyl ether. Drying,
evaporation and chromatography on silica gel gave 7.2 g (85%) of the sty-
15   rene derivative **22**.

Example 6

20
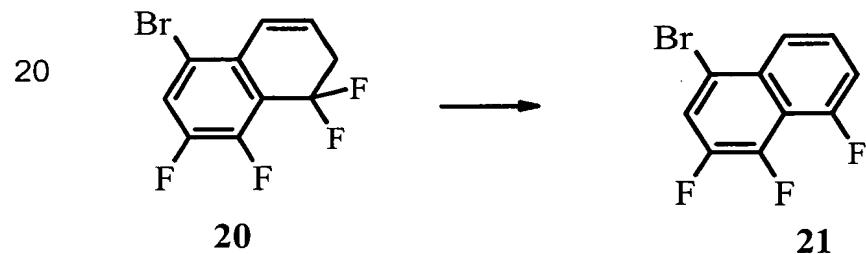
20   21

25

The reaction was carried out as described above. Yield: 81%. Compounds
according to the invention are accessible from compounds **20**, **21** and **22**
(or analogous compounds), as is evident to the person skilled in the art,
inter alia from the description and the following examples.

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- 34 -

Example 7

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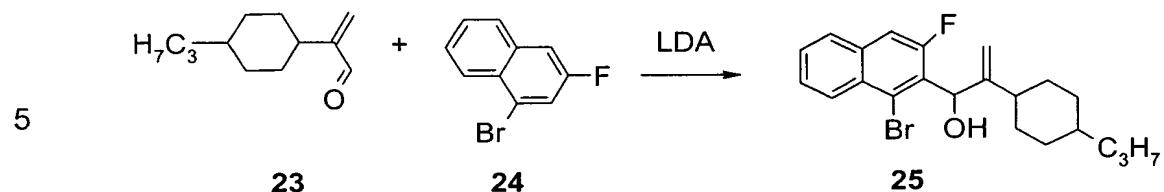
A solution of 13.5 g (60.0 mmol) of the bromofluoronaphthalene **24** in
10 ml of THF is added at -75°C to 27.0 ml of a solution of 2N lithium diiso-
propylamide (LDA) in cyclohexane/ethylbenzene/THF (52.4 mmol) which
has been diluted with 100 ml of THF. After 2 hours at the low temperature,
8.5 g (47.3 mmol) of the aldehyde **23** in 10 ml of THF are added. After 30
minutes, the cooling is removed, and 100 ml of 1N HCl are added to the
batch at 20°C. Extraction of the aqueous phase, drying of the organic
phase, evaporation and chromatography gives the allyl alcohol **25**.

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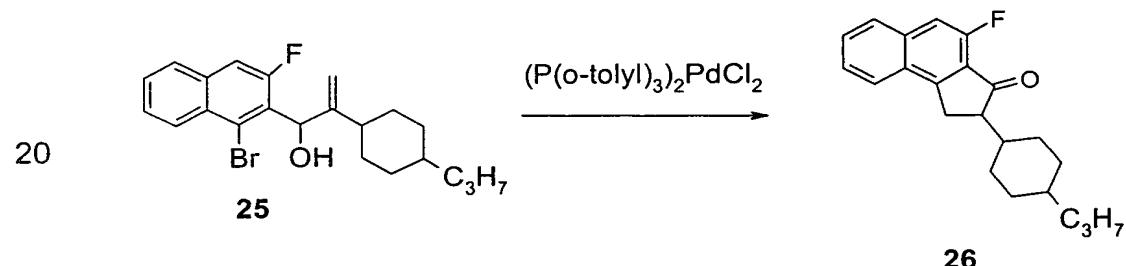
35.0 g (86.6 mmol) of the allyl alcohol **25**, 5.5 g of bis(tri-*o*-tolylphosphine)-
palladium dichloride and 50 ml of triethylamine are dissolved in 390 ml of
acetonitrile and heated to 90°C until the allyl alcohol has completely
reacted. The cooled batch is introduced into water. Extraction, drying,
evaporation and chromatography gives the ketone **26**.

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Example 8

26   BF$_3$· OEt$_2$ HS⌒⌒SH   **27**
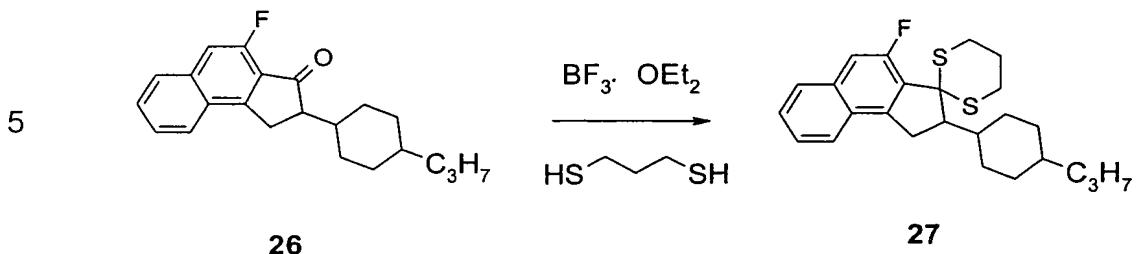
10.0 g (30.8 mmol) of the ketone **26** and 3.2 ml (31.0 mmol) of propane-dithiol are dissolved in 50 ml of dichloromethane, 7.0 ml of boron trifluoride/diethyl ether complex are added at from 6 to 7°C, and the mixture is subsequently stirred overnight at room temperature. The batch is introduced into 10 ml of saturated sodium hydrogencarbonate solution and stirred until the evolution of gas is complete. After extraction of the aqueous phase, drying of the organic phase, evaporation and filtration through silica gel, the resultant residue is employed in the next step without further purification.

27   HF. Py   DBH   **28**
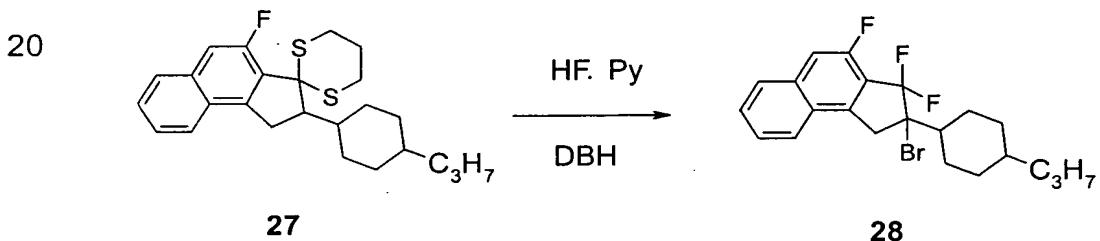
10.0 g of the crude thioketal **27**, dissolved in 30 ml of dichloromethane, are added slowly at -75°C to a mixture of 28.6 g (100 mmol) of 1,3-dibromo-5,5-dimethylhydantoin (DBH), 80 ml of a 65% solution of hydrogen fluoride in pyridine and 50 ml of dichloromethane. The batch is subsequently stirred overnight at room temperature. The reaction mixture is added to ice-cooled hydrogen sulfite solution and deacidified using saturated sodium hydrogencarbonate solution and sodium hydroxide solution. Extraction, drying, evaporation, re-washing with water, chromatography and crystallisation from hexane gives the cyclopenta[a]naphthalene derivative **28**.

28   DBU   **29**

5
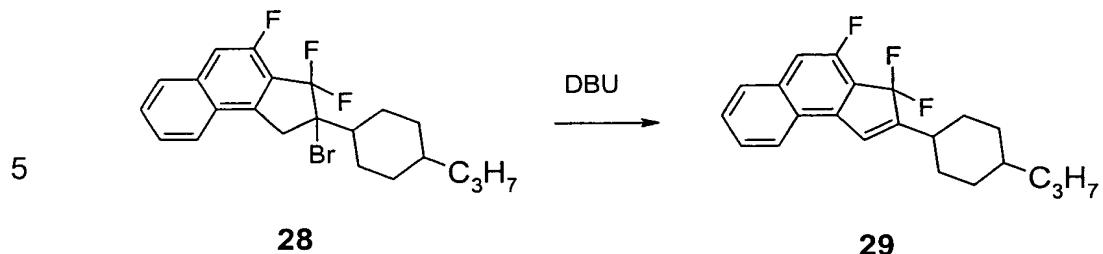
6.0 g (14.1 mmol) of the cyclopenta[a]naphthalene derivative **28** are dis-
solved in 50 ml of dichloromethane, 2.4 ml (16.0 mmol) of 1,8-diaza-
bicyclo[5.4.0]undec-7-ene (DBU) are added, and the mixture is stirred at
room temperature until the starting material has completely reacted. The
batch is washed with water and saturated sodium chloride solution, evapo-
rated and chromatographed. The cyclopenta[a]naphthalene derivative **29**
is isolated.

Example 9

29   **30**
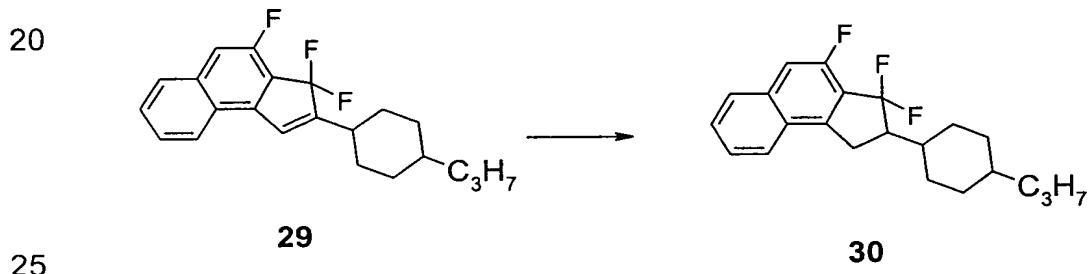
4.0 g (11.6 mmol) of the cyclopenta[a]naphthalene derivative **29** are dis-
solved in 50 ml of THF and hydrogenated at room temperature and atmos-
pheric pressure on a palladium catalyst. Evaporation, chromatography on
silica gel and crystallisation gives the cyclopenta[a]naphthalene derivative
30.

Example 10

31   BuLi / B(OH)$_3$ **32**
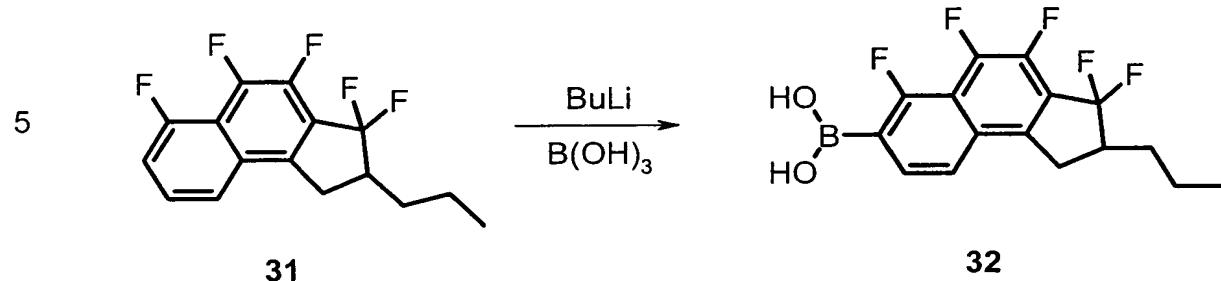
The cyclopenta[a]naphthalene derivative **31** prepared analogously to Examples 7 to 9 was converted into the cyclopenta[a]naphthalene deriva-tive **32** as follows: under nitrogen and at -70°C, 4.5 ml (7.20 mmol) of a 15% solution of butyllithium in *n*-hexane were added to a solution of 2.5 g (7.18 mmol) of the naphthalene derivative **31** in 60 ml of THF. After 1 hour, 0.91 ml (8.0 mmol) of trimethyl borate was added to the batch. When the addition was complete, the cooling was removed, and the batch was hydrolysed at 10°C. The reaction mixture was acidified using 2N HCl solu-tion. The aqueous phase was extracted with methyl tert-butyl ether. The organic phase was washed with sat. NaCl solution, dried over sodium sulfate and evaporated. The residue, which contained the boronic acid **32**, was employed in the next step without further purification.

32   Pd(PPh$_3$)$_4$ **33**
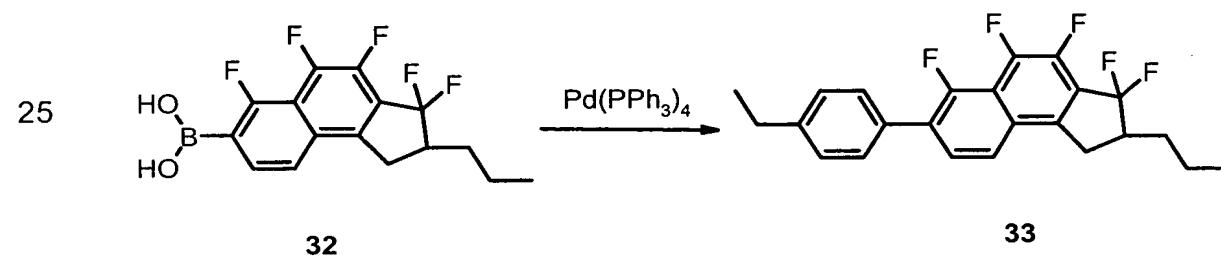
1.3 g (5.0 mmol) of sodium metaborate octahydrate were dissolved in 2.0 ml of water under a nitrogen atmosphere, and 83 mg of bis(triphenyl-phosphine)palladium(II) chloride, 50 µl of hydrazinium hydroxide and 1.11 g (6.0 mmol) of *p*-bromoethylbenzene were added successively. After 5 minutes at room temperature, 2.1 g (6.0 mmol) of the boronic acid dis-solved in 3.75 ml of THF were added to the batch, and the mixture was

- 38 -

heated at the boil overnight. The aqueous phase was extracted with methyl tert-butyl ether, and the organic phase was washed with water, dried and evaporated. The purification was carried out by means of multiple chromatography on silica gel (heptane).

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Example 11

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31   BuLi   34

15

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35
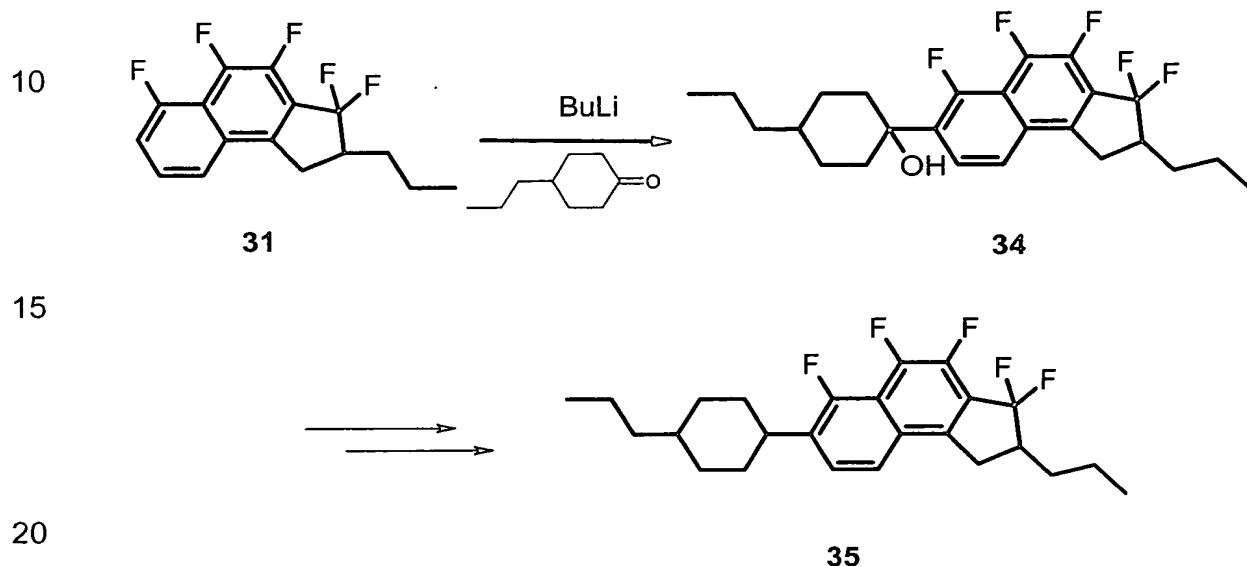
The cyclopenta[a]naphthalene derivative **31** was converted into the cyclopenta[a]naphthalene derivative **35** as follows:

25

Under nitrogen and at -70°C, 4.5 ml (7.20 mmol) of a 15% solution of butyllithium in *n*-hexane were added to a solution of 2.5 g (7.18 mmol) of the naphthalene derivative **31** in 60 ml of THF. After 1 hour, 1.1 g (8.0 mmol) of 4-propylcyclohexanone in 5 ml of THF were added to the batch. After 1 hour, the cooling was removed, and the batch was hydro-lysed at 10°C. The reaction mixture was acidified using 2N HCl solution. The aqueous phase was extracted with methyl tert-butyl ether. The organic phase was washed with sat. NaCl solution, dried over sodium sulfate and evaporated. The residue was passed through silica gel (methyl tert-butyl ether/heptane 1:10).

30

35

A mixture of 50 ml of pyridine and 50 ml of phosphoryl chloride was added to a solution of 3.6 g (7.0 mmol) of the benzyl alcohol **34** in 30 ml of pyridine at such a rate that the batch boiled. After 4 hours, the batch was carefully poured into ice/water. The aqueous phase was extracted with dichloromethane; the organic phase was washed with sat. NaCl solution, dried over sodium sulfate, evaporated and passed through silica gel (hexane). 2.0 g (4.0 mmol) of the resultant elimination product were dissolved in 20 ml of THF and hydrogenated on a Pd catalyst until the uptake of hydrogen was complete. The catalyst was separated off, and the solution was evaporated. The residue was passed through silica gel (hexane), giving **35** after removal of the solvent.

Example 12

1. LDA
2. TMSCl
3. mCPBA

8   **36**
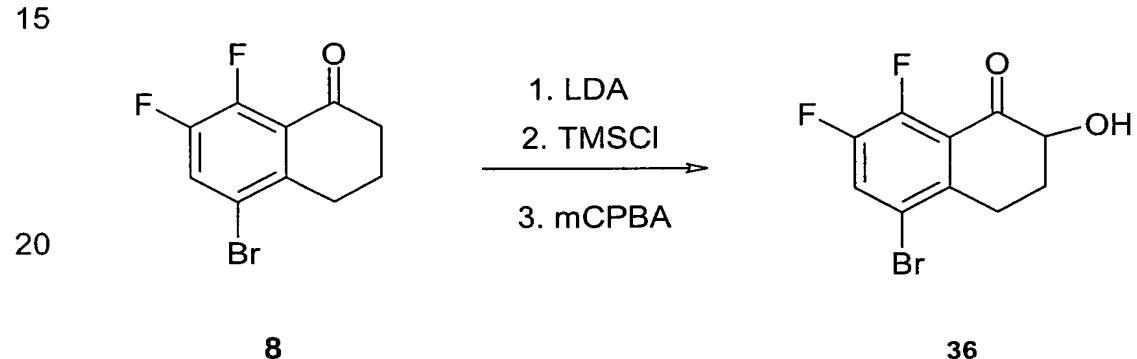
5.0 g (19.2 mmol) of the ketone **8**, dissolved in 30 ml of THF, were added at -70°C to a mixture of 40 ml of THF, 5.2 ml (41.2 mmol) of trimethylsilyl chloride and 10.3 ml (20 mmol) of a 2M solution of lithium diisopropylamide. After 30 minutes, 40 ml of triethylamine and sat. sodium hydrogencarbonate solution were added to the batch. The aqueous phase was extracted with methyl tert-butyl ether. The organic phase was dried over sodium sulfate, evaporated and filtered through silica gel (methyl tert-butyl ether/pentane 1:20).

The residue was taken up in 40 ml of THF, and a solution of 4.9 g (20.0 mmol) of m-chloroperbenzoic acid in 20 ml of THF was added at 0°C. After 1 hour, water was added to the batch, which was then extracted

with methyl tert-butyl ether. The organic phase was dried over sodium sulfate, evaporated and filtered through silica gel (methyl tert-butyl ether/heptane 1:5), giving 4.4 g (80%) of the hydroxy ketone **36**.

36   **37**
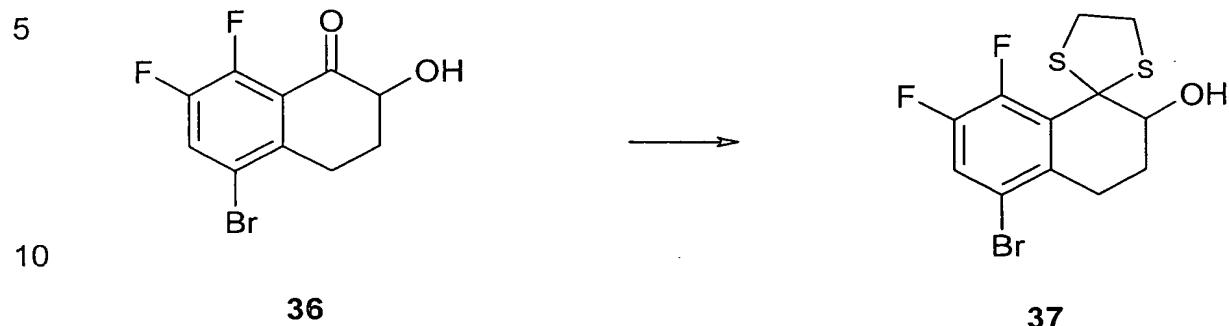
The synthesis of the thioketal **37** was carried out as already described in Example 3 for compound **14**.

1. NaH
2. BnBr

37   **38**
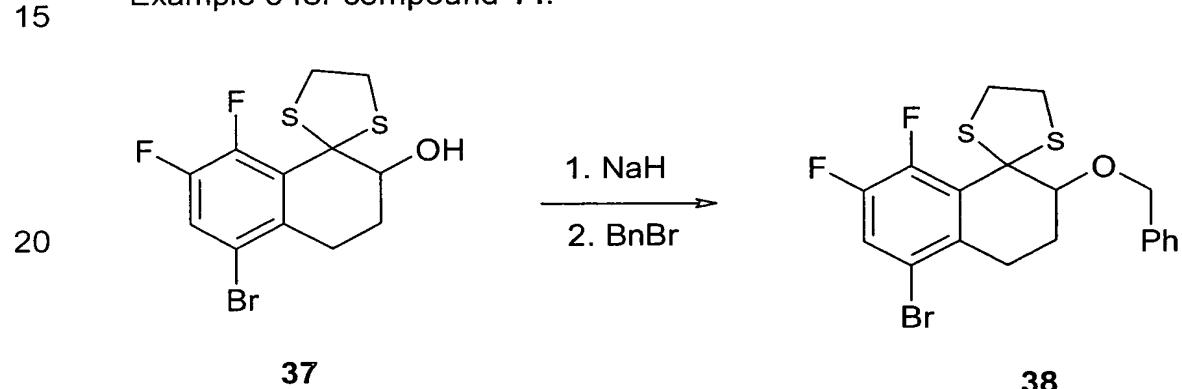
A solution of 14.1 g (40.0 mmol) of the thioketal **37** in 20 ml of THF was added to a suspension of 1.8 g (60%, 45.7 mmol) of sodium hydride in 40 ml of THF. After 2 hours, 500 mg of tetrabutylammonium iodide and 5.5 ml (45.7 mmol) of benzyl bromide in 20 ml of THF were added to the suspension. The batch was stirred overnight and subsequently carefully hydrolysed. The aqueous phase was extracted with methyl tert-butyl ether. The organic phase was dried over sodium sulfate, evaporated and passed through silica gel (methyl tert-butyl ether/heptane 1:20), giving 16.1 g (91%) of the benzyl ether **38**.

The alcohol **39** can be prepared from **38** analogously to the processes of Examples 7 to 9. During the preparation of the intermediate thioketal, the benzyl ether is cleaved. The protecting group must then be re-introduced in the manner already described.

5

10

39   **40**

pyridine/POCl$_3$
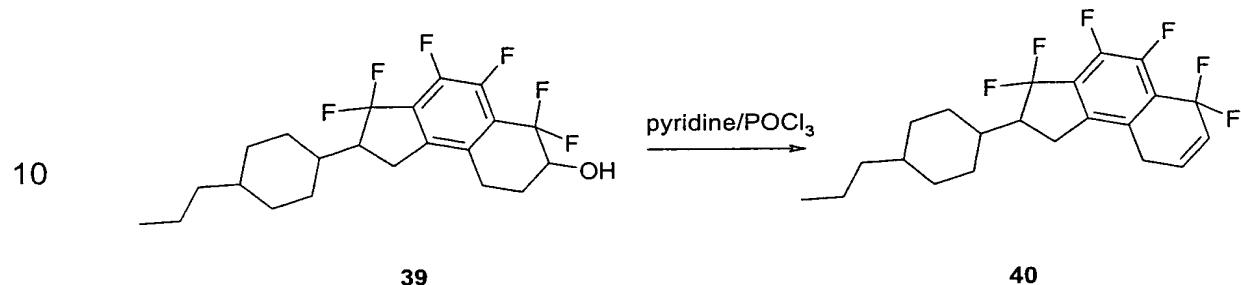
15   A mixture of 50 ml of pyridine and 50 ml of phosphoryl chloride was added to a solution of 2.9 g (7.0 mmol) of the naphthalene **39** in 30 ml of pyridine at such a rate that the batch boiled. After 4 hours, the batch was carefully poured onto ice. The aqueous phase was extracted with dichloromethane, and the organic phase was washed with sat. NaCl solution, dried over

20   sodium sulfate, evaporated and passed through silica gel (hexane), giving 1.7 g (62%) of the unsaturated compound **40**.

Example 13

25

1. NaH

2. BnBr

5   **41**
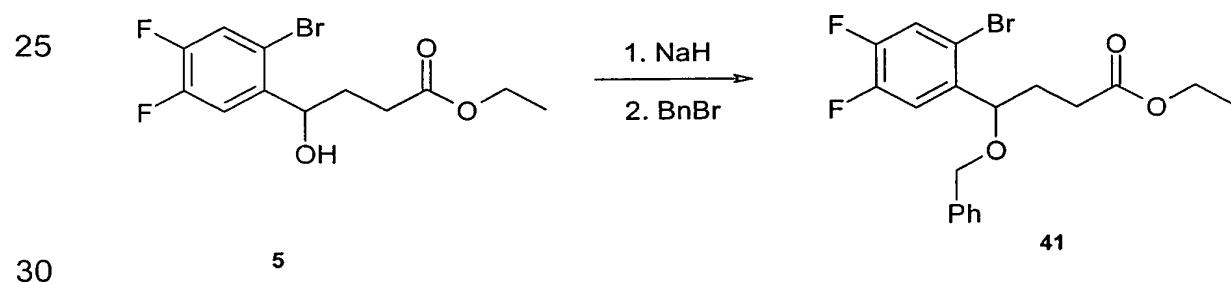
30

The synthesis is carried out in accordance with the procedure indicated above in Example 12 for compound **38**.

35

5

41 → **42**

1. KOH/EtOH

2. SOCl$_2$
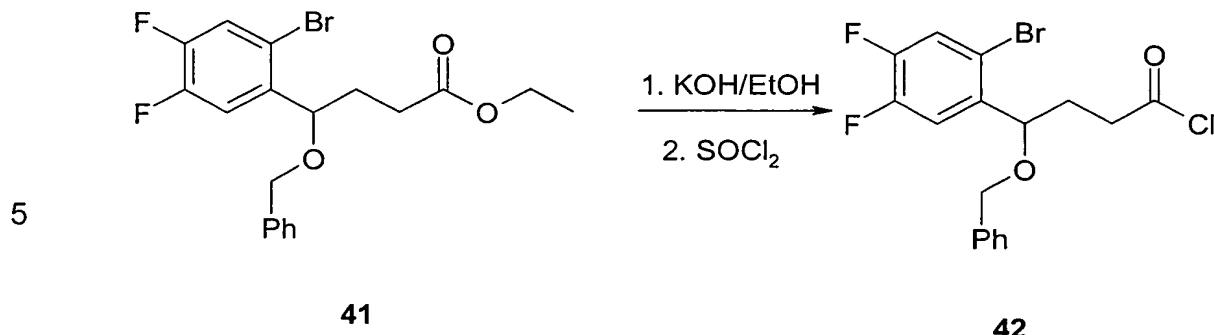
10   An ethanolic potassium hydroxide solution was added to 7.3 g (17.7 mmol) of the ester **41**, and the mixture was refluxed until the reaction was complete (TLC). The alcohol was removed in a rotary evaporator. The residue was taken up in water and acidified. After extraction with methyl tert-butyl ether, the organic phase was dried over sodium sulfate, and the solvent

15   was removed. Thionyl chloride and one drop of DMF were added to the resultant residue, and the mixture was refluxed until the evolution of gas was complete. Excess thionyl chloride was distilled off. The crude product **42** was employed in the next step without further purification.

20

42 → **43**

AlCl$_3$

25
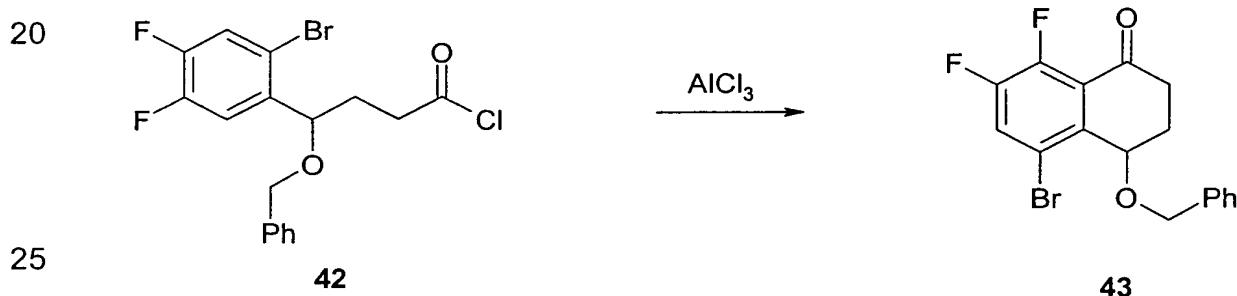
30   A solution of the acid chloride **42** in 50 ml of dichloromethane was added slowly at 0°C to a suspension of 4 g of aluminium chloride in 50 ml of dichloromethane. When the addition was complete, the reaction was monitored by TLC. When the reaction was complete, ice was carefully added to the batch. When the evolution of HCl had subsided, the mixture was diluted with water and acidified. The aqueous phase was extracted

35   with dichloromethane. The organic phase was washed with sat. sodium

- 43 -

chloride solution, dried over sodium sulfate and evaporated. The residue
was passed through silica gel (methyl tert-butyl ether/heptane 1:5).

5

10 **43**

44
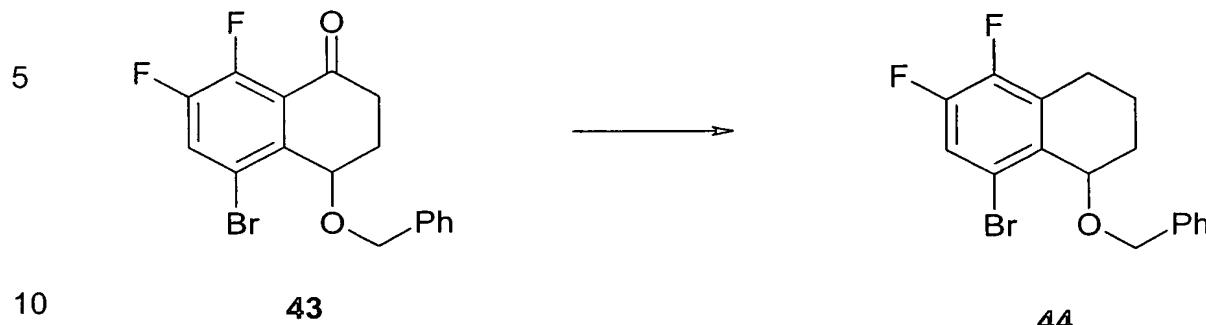
11.0 g (30.0 mmol) of the ketone **43** and 4.3 ml (90.0 mmol) of hydrazin-
ium hydroxide were added to a solution of 6.7 g of potassium hydroxide in
50 ml of diethylene glycol. The batch was slowly heated to 180°C. When
15 the evolution of nitrogen was complete and after cooling to room tempera-
ture, the batch was diluted with water and extracted a number of times with
methyl tert-butyl ether. The organic phase was dried over sodium sulfate,
evaporated and passed through silica gel (methyl tert-butyl ether/heptane
1:20), giving 6.4 g (60%) of the benzyl ether **44**.

20

The alcohol **45** can be prepared from **44** analogously to the processes of
Examples 7 to 9. During the preparation of the intermediate thioketal, the
benzyl ether is cleaved. The protecting group must then be re-introduced
in the manner already described.

25

pyridine/POCl₃

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45

46
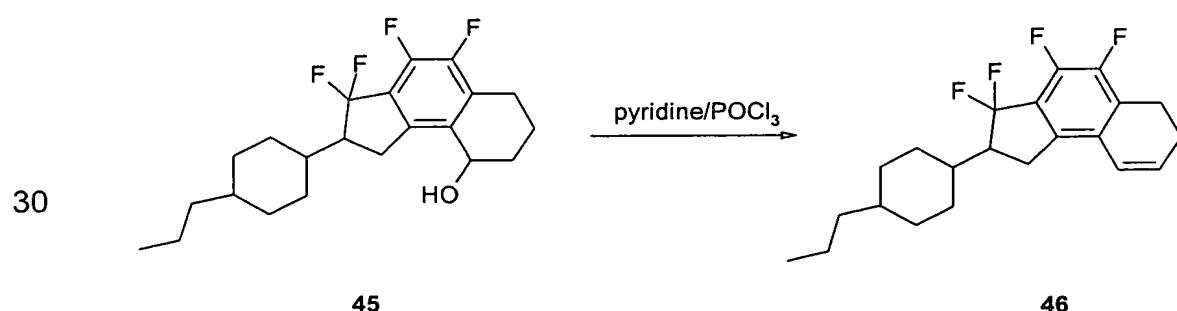
The synthesis of compound **46** was carried out analogously to the method
35 indicated in Example 12.

The following compounds are prepared analogously to Examples 1 to 13. "bond" here stands for a single bond:

Examples 14-110
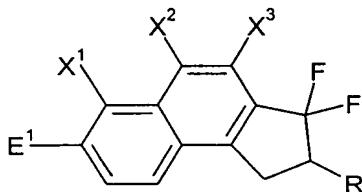
Example	E^1	X^1	X^2	X^3	R
14	H	H	H	H	CH_3
15	H	H	H	H	C_2H_5
16	H	H	H	H	$n\text{-}C_3H_7$
17	H	H	H	H	$n\text{-}C_4H_9$
18	H	H	H	H	$n\text{-}C_5H_{11}$
19	H	H	H	H	$n\text{-}C_6H_{13}$
20	H	H	H	H	$n\text{-}C_7H_{15}$
21	H	H	H	F	CH_3
22	H	H	H	F	C_2H_5
23	H	H	H	F	$n\text{-}C_3H_7$
24	H	H	H	F	$n\text{-}C_4H_9$
25	H	H	H	F	$n\text{-}C_5H_{11}$
26	H	H	H	F	$n\text{-}C_6H_{13}$
27	H	H	H	F	$n\text{-}C_7H_{15}$
28	H	H	F	F	CH_3
29	H	H	F	F	C_2H_5
30	H	H	F	F	$n\text{-}C_3H_7$
31	H	H	F	F	$n\text{-}C_4H_9$
32	H	H	F	F	$n\text{-}C_5H_{11}$
33	H	H	F	F	$n\text{-}C_6H_{13}$
34	H	H	F	F	$n\text{-}C_7H_{15}$

Example	E^1	X^1	X^2	X^3	R
35	H	F	F	F	CH_3
36	H	F	F	F	C_2H_5
37	H	F	F	F	$n\text{-}C_4H_9$
38	H	F	F	F	$n\text{-}C_5H_{11}$
39	H	F	F	F	$n\text{-}C_6H_{13}$
40	H	F	F	F	$n\text{-}C_7H_{15}$
41	CH_3	H	F	F	CH_3
42	CH_3	H	F	F	C_2H_5
43	CH_3	H	F	F	$n\text{-}C_3H_7$
44	CH_3	H	F	F	$n\text{-}C_4H_9$
45	CH_3	H	F	F	$n\text{-}C_5H_{11}$
46	CH_3	H	F	F	$n\text{-}C_6H_{13}$
47	CH_3	H	F	F	$n\text{-}C_7H_{15}$
48	CH_3	F	F	F	CH_3
49	CH_3	F	F	F	C_2H_5
50	CH_3	F	F	F	$n\text{-}C_3H_7$
51	CH_3	F	F	F	$n\text{-}C_4H_9$
52	CH_3	F	F	F	$n\text{-}C_5H_{11}$
53	CH_3	F	F	F	$n\text{-}C_6H_{13}$
54	CH_3	F	F	F	$n\text{-}C_7H_{15}$
55	C_2H_5	H	F	F	CH_3
56	C_2H_5	H	F	F	C_2H_5
57	C_2H_5	H	F	F	$n\text{-}C_3H_7$
58	C_2H_5	H	F	F	$n\text{-}C_4H_9$
59	C_2H_5	H	F	F	$n\text{-}C_5H_{11}$
60	C_2H_5	H	F	F	$n\text{-}C_6H_{13}$
61	C_2H_5	H	F	F	$n\text{-}C_7H_{15}$
62	C_2H_5	F	F	F	CH_3
63	C_2H_5	F	F	F	C_2H_5
64	C_2H_5	F	F	F	$n\text{-}C_3H_7$
65	C_2H_5	F	F	F	$n\text{-}C_4H_9$
66	C_2H_5	F	F	F	$n\text{-}C_5H_{11}$
67	C_2H_5	F	F	F	$n\text{-}C_6H_{13}$

Example	E^1	X^1	X^2	X^3	R
68	C_2H_5	F	F	F	$n\text{-}C_7H_{15}$
69	$n\text{-}C_3H_7$	H	F	F	CH_3
70	$n\text{-}C_3H_7$	H	F	F	C_2H_5
71	$n\text{-}C_3H_7$	H	F	F	$n\text{-}C_3H_7$
72	$n\text{-}C_3H_7$	H	F	F	$n\text{-}C_4H_9$
73	$n\text{-}C_3H_7$	H	F	F	$n\text{-}C_5H_{11}$
74	$n\text{-}C_3H_7$	H	F	F	$n\text{-}C_6H_{13}$
75	$n\text{-}C_3H_7$	H	F	F	$n\text{-}C_7H_{15}$
76	$n\text{-}C_3H_7$	F	F	F	CH_3
77	$n\text{-}C_3H_7$	F	F	F	C_2H_5
78	$n\text{-}C_3H_7$	F	F	F	$n\text{-}C_3H_7$
79	$n\text{-}C_3H_7$	F	F	F	$n\text{-}C_4H_9$
80	$n\text{-}C_3H_7$	F	F	F	$n\text{-}C_5H_{11}$
81	$n\text{-}C_3H_7$	F	F	F	$n\text{-}C_6H_{13}$
82	$n\text{-}C_3H_7$	F	F	F	$n\text{-}C_7H_{15}$
83	$n\text{-}C_4H_9$	H	F	F	CH_3
84	$n\text{-}C_4H_9$	H	F	F	C_2H_5
85	$n\text{-}C_4H_9$	H	F	F	$n\text{-}C_3H_7$
86	$n\text{-}C_4H_9$	H	F	F	$n\text{-}C_4H_9$
87	$n\text{-}C_4H_9$	H	F	F	$n\text{-}C_5H_{11}$
88	$n\text{-}C_4H_9$	H	F	F	$n\text{-}C_6H_{13}$
89	$n\text{-}C_4H_9$	H	F	F	$n\text{-}C_7H_{15}$
90	$n\text{-}C_4H_9$	F	F	F	CH_3
91	$n\text{-}C_4H_9$	F	F	F	C_2H_5
92	$n\text{-}C_4H_9$	F	F	F	$n\text{-}C_3H_7$
93	$n\text{-}C_4H_9$	F	F	F	$n\text{-}C_4H_9$
94	$n\text{-}C_4H_9$	F	F	F	$n\text{-}C_5H_{11}$
95	$n\text{-}C_4H_9$	F	F	F	$n\text{-}C_6H_{13}$
96	$n\text{-}C_4H_9$	F	F	F	$n\text{-}C_7H_{15}$
97	$n\text{-}C_5H_{11}$	H	F	F	CH_3
98	$n\text{-}C_5H_{11}$	H	F	F	C_2H_5
99	$n\text{-}C_5H_{11}$	H	F	F	$n\text{-}C_3H_7$
100	$n\text{-}C_5H_{11}$	H	F	F	$n\text{-}C_4H_9$

Example	E^1	X^1	X^2	X^3	R
101	$n\text{-}C_5H_{11}$	H	F	F	$n\text{-}C_5H_{11}$
102	$n\text{-}C_5H_{11}$	H	F	F	$n\text{-}C_6H_{13}$
103	$n\text{-}C_5H_{11}$	H	F	F	$n\text{-}C_7H_{15}$
104	$n\text{-}C_5H_{11}$	F	F	F	CH_3
105	$n\text{-}C_5H_{11}$	F	F	F	C_2H_5
106	$n\text{-}C_5H_{11}$	F	F	F	$n\text{-}C_3H_7$
107	$n\text{-}C_5H_{11}$	F	F	F	$n\text{-}C_4H_9$
108	$n\text{-}C_5H_{11}$	F	F	F	$n\text{-}C_5H_{11}$
109	$n\text{-}C_5H_{11}$	F	F	F	$n\text{-}C_6H_{13}$
110	$n\text{-}C_5H_{11}$	F	F	F	$n\text{-}C_7H_{15}$

Examples 111 - 228
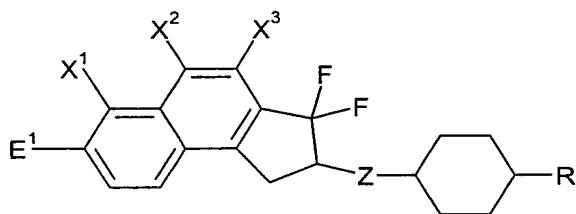
Example	E^1	X^1	X^2	X^3	Z	R
111	H	H	H	F	Bond	CH_3
112	H	H	H	F	Bond	C_2H_5
113	H	H	H	F	Bond	$n\text{-}C_4H_9$
114	H	H	H	F	Bond	$n\text{-}C_5H_{11}$
115	H	H	H	F	Bond	$n\text{-}C_6H_{13}$
116	H	H	H	F	Bond	$n\text{-}C_7H_{15}$
117	H	H	F	F	Bond	CH_3
118	H	H	F	F	Bond	C_2H_5
119	H	H	F	F	Bond	$n\text{-}C_3H_7$
120	H	H	F	F	Bond	$n\text{-}C_4H_9$
121	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
122	H	H	F	F	Bond	$n\text{-}C_6H_{13}$

Example	E^1	X^1	X^2	X^3	Z	R
123	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
124	H	F	F	F	Bond	CH_3
125	H	F	F	F	Bond	C_2H_5
126	H	F	F	F	Bond	$n\text{-}C_3H_7$
127	H	F	F	F	Bond	$n\text{-}C_4H_9$
128	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
129	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
130	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
131	H	F	F	F	CF_2CF_2	CH_3
132	H	F	F	F	CF_2CF_2	C_2H_5
133	H	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
134	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
135	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
136	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
137	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
138	H	F	F	F	OCF_2	CH_3
139	H	F	F	F	OCF_2	C_2H_5
140	H	F	F	F	OCF_2	$n\text{-}C_3H_7$
141	H	F	F	F	OCF_2	$n\text{-}C_4H_9$
142	H	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
143	H	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
144	H	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
145	CH_3	H	F	F	Bond	CH_3
146	CH_3	H	F	F	Bond	C_2H_5
147	CH_3	H	F	F	Bond	$n\text{-}C_3H_7$
148	CH_3	H	F	F	Bond	$n\text{-}C_4H_9$
149	CH_3	H	F	F	Bond	$n\text{-}C_5H_{11}$
150	CH_3	H	F	F	Bond	$n\text{-}C_6H_{13}$
151	CH_3	H	F	F	Bond	$n\text{-}C_7H_{15}$
152	CH_3	F	F	F	Bond	CH_3
153	CH_3	F	F	F	Bond	C_2H_5
154	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
155	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$

Example	E^1	X^1	X^2	X^3	Z	R
156	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
157	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
158	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
159	CH_3	F	F	F	CF_2CF_2	CH_3
160	CH_3	F	F	F	CF_2CF_2	C_2H_5
161	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
162	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
163	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
164	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
165	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
166	CH_3	F	F	F	OCF_2	CH_3
167	CH_3	F	F	F	OCF_2	C_2H_5
168	CH_3	F	F	F	OCF_2	$n\text{-}C_3H_7$
169	CH_3	F	F	F	OCF_2	$n\text{-}C_4H_9$
170	CH_3	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
171	CH_3	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
172	CH_3	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
173	C_2H_5	H	F	F	Bond	CH_3
174	C_2H_5	H	F	F	Bond	C_2H_5
175	C_2H_5	H	F	F	Bond	$n\text{-}C_3H_7$
176	C_2H_5	H	F	F	Bond	$n\text{-}C_4H_9$
177	C_2H_5	H	F	F	Bond	$n\text{-}C_5H_{11}$
178	C_2H_5	H	F	F	Bond	$n\text{-}C_6H_{13}$
179	C_2H_5	H	F	F	Bond	$n\text{-}C_7H_{15}$
180	C_2H_5	F	F	F	Bond	CH_3
181	C_2H_5	F	F	F	Bond	C_2H_5
182	C_2H_5	F	F	F	Bond	$n\text{-}C_3H_7$
183	C_2H_5	F	F	F	Bond	$n\text{-}C_4H_9$
184	C_2H_5	F	F	F	Bond	$n\text{-}C_5H_{11}$
185	C_2H_5	F	F	F	Bond	$n\text{-}C_6H_{13}$
186	C_2H_5	F	F	F	Bond	$n\text{-}C_7H_{15}$
187	$n\text{-}C_3H_7$	H	F	F	Bond	CH_3
188	$n\text{-}C_3H_7$	H	F	F	Bond	C_2H_5

Example	E^1	X^1	X^2	X^3	Z	R
189	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_3H_7$
190	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_4H_9$
191	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_5H_{11}$
192	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_6H_{13}$
193	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_7H_{15}$
194	$n\text{-}C_3H_7$	F	F	F	Bond	CH_3
195	$n\text{-}C_3H_7$	F	F	F	Bond	C_2H_5
196	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_3H_7$
197	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_4H_9$
198	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_5H_{11}$
199	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_6H_{13}$
200	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_7H_{15}$
201	$n\text{-}C_4H_9$	H	F	F	Bond	CH_3
202	$n\text{-}C_4H_9$	H	F	F	Bond	C_2H_5
203	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_3H_7$
204	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_4H_9$
205	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_5H_{11}$
206	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_6H_{13}$
207	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_7H_{15}$
208	$n\text{-}C_4H_9$	F	F	F	Bond	CH_3
209	$n\text{-}C_4H_9$	F	F	F	Bond	C_2H_5
210	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_3H_7$
211	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_4H_9$
212	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_5H_{11}$
213	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_6H_{13}$
214	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_7H_{15}$
215	$n\text{-}C_5H_{11}$	H	F	F	Bond	CH_3
216	$n\text{-}C_5H_{11}$	H	F	F	Bond	C_2H_5
217	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_3H_7$
218	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_4H_9$
219	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_5H_{11}$
220	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_6H_{13}$
221	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_7H_{15}$

Example	E^1	X^1	X^2	X^3	Z	R
222	$n\text{-}C_5H_{11}$	F	F	F	Bond	CH_3
223	$n\text{-}C_5H_{11}$	F	F	F	Bond	C_2H_5
224	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_3H_7$
225	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_4H_9$
226	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_5H_{11}$
227	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_6H_{13}$
228	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 229 - 347
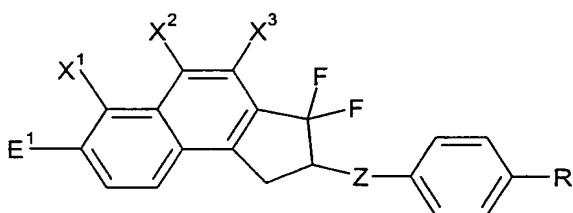
Example	E^1	X^1	X^2	X^3	Z	R
229	H	H	H	F	Bond	CH_3
230	H	H	H	F	Bond	C_2H_5
231	H	H	H	F	Bond	$n\text{-}C_3H_7$
232	H	H	H	F	Bond	$n\text{-}C_4H_9$
233	H	H	H	F	Bond	$n\text{-}C_5H_{11}$
234	H	H	H	F	Bond	$n\text{-}C_6H_{13}$
235	H	H	H	F	Bond	$n\text{-}C_7H_{15}$
236	H	H	F	F	Bond	CH_3
237	H	H	F	F	Bond	C_2H_5
238	H	H	F	F	Bond	$n\text{-}C_3H_7$
239	H	H	F	F	Bond	$n\text{-}C_4H_9$
240	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
241	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
242	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
243	H	F	F	F	Bond	CH_3

Example	E^1	X^1	X^2	X^3	Z	R
244	H	F	F	F	Bond	C_2H_5
245	H	F	F	F	Bond	$n\text{-}C_3H_7$
246	H	F	F	F	Bond	$n\text{-}C_4H_9$
247	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
248	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
249	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
250	H	F	F	F	CF_2CF_2	CH_3
251	H	F	F	F	CF_2CF_2	C_2H_5
252	H	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
253	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
254	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
255	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
256	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
257	H	F	F	F	CF_2O	CH_3
258	H	F	F	F	CF_2O	C_2H_5
259	H	F	F	F	CF_2O	$n\text{-}C_3H_7$
260	H	F	F	F	CF_2O	$n\text{-}C_4H_9$
261	H	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
262	H	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
263	H	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
264	CH_3	H	F	F	Bond	CH_3
265	CH_3	H	F	F	Bond	C_2H_5
266	CH_3	H	F	F	Bond	$n\text{-}C_3H_7$
267	CH_3	H	F	F	Bond	$n\text{-}C_4H_9$
268	CH_3	H	F	F	Bond	$n\text{-}C_5H_{11}$
269	CH_3	H	F	F	Bond	$n\text{-}C_6H_{13}$
270	CH_3	H	F	F	Bond	$n\text{-}C_7H_{15}$
271	CH_3	F	F	F	Bond	CH_3
272	CH_3	F	F	F	Bond	C_2H_5
273	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
274	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$
275	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
276	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$

Example	E^1	X^1	X^2	X^3	Z	R
277	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
278	CH_3	F	F	F	CF_2CF_2	CH_3
279	CH_3	F	F	F	CF_2CF_2	C_2H_5
280	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
281	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
282	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
283	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
284	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
285	CH_3	F	F	F	CF_2O	CH_3
286	CH_3	F	F	F	CF_2O	C_2H_5
287	CH_3	F	F	F	CF_2O	$n\text{-}C_3H_7$
288	CH_3	F	F	F	CF_2O	$n\text{-}C_4H_9$
289	CH_3	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
290	CH_3	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
291	CH_3	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
292	C_2H_5	H	F	F	Bond	CH_3
293	C_2H_5	H	F	F	Bond	C_2H_5
294	C_2H_5	H	F	F	Bond	$n\text{-}C_3H_7$
295	C_2H_5	H	F	F	Bond	$n\text{-}C_4H_9$
296	C_2H_5	H	F	F	Bond	$n\text{-}C_5H_{11}$
297	C_2H_5	H	F	F	Bond	$n\text{-}C_6H_{13}$
298	C_2H_5	H	F	F	Bond	$n\text{-}C_7H_{15}$
299	C_2H_5	F	F	F	Bond	CH_3
300	C_2H_5	F	F	F	Bond	C_2H_5
301	C_2H_5	F	F	F	Bond	$n\text{-}C_3H_7$
302	C_2H_5	F	F	F	Bond	$n\text{-}C_4H_9$
303	C_2H_5	F	F	F	Bond	$n\text{-}C_5H_{11}$
304	C_2H_5	F	F	F	Bond	$n\text{-}C_6H_{13}$
305	C_2H_5	F	F	F	Bond	$n\text{-}C_7H_{15}$
306	$n\text{-}C_3H_7$	H	F	F	Bond	CH_3
307	$n\text{-}C_3H_7$	H	F	F	Bond	C_2H_5
308	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_3H_7$
309	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_4H_9$

Example	E^1	X^1	X^2	X^3	Z	R
310	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_5H_{11}$
311	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_6H_{13}$
312	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_7H_{15}$
313	$n\text{-}C_3H_7$	F	F	F	Bond	CH_3
314	$n\text{-}C_3H_7$	F	F	F	Bond	C_2H_5
315	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_3H_7$
316	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_4H_9$
317	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_5H_{11}$
318	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_6H_{13}$
319	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_7H_{15}$
320	$n\text{-}C_4H_9$	H	F	F	Bond	CH_3
321	$n\text{-}C_4H_9$	H	F	F	Bond	C_2H_5
322	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_3H_7$
323	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_4H_9$
324	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_5H_{11}$
325	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_6H_{13}$
326	$n\text{-}C_4H_9$	·H	F	F	Bond	$n\text{-}C_7H_{15}$
327	$n\text{-}C_4H_9$	F	F	F	Bond	CH_3
328	$n\text{-}C_4H_9$	F	F	F	Bond	C_2H_5
329	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_3H_7$
330	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_4H_9$
331	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_5H_{11}$
332	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_6H_{13}$
333	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_7H_{15}$
334	$n\text{-}C_5H_{11}$	H	F	F	Bond	CH_3
335	$n\text{-}C_5H_{11}$	H	F	F	Bond	C_2H_5
336	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_3H_7$
337	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_4H_9$
338	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_5H_{11}$
339	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_6H_{13}$
340	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_7H_{15}$
341	$n\text{-}C_5H_{11}$	F	F	F	Bond	CH_3
342	$n\text{-}C_5H_{11}$	F	F	F	Bond	C_2H_5

Example	E¹	X¹	X²	X³	Z	R
343	n-C_5H_{11}	F	F	F	Bond	n-C_3H_7
344	n-C_5H_{11}	F	F	F	Bond	n-C_4H_9
345	n-C_5H_{11}	F	F	F	Bond	n-C_5H_{11}
346	n-C_5H_{11}	F	F	F	Bond	n-C_6H_{13}
347	n-C_5H_{11}	F	F	F	Bond	n-C_7H_{15}

Examples 348 - 466
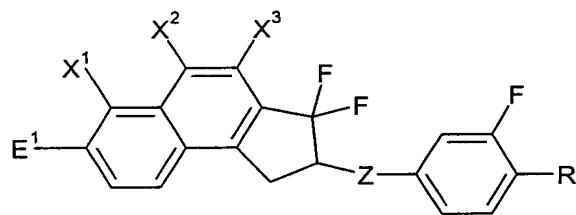
Example	E¹	X¹	X²	X³	Z	R
348	H	H	H	F	Bond	CH_3
349	H	H	H	F	Bond	C_2H_5
350	H	H	H	F	Bond	n-C_3H_7
351	H	H	H	F	Bond	n-C_4H_9
352	H	H	H	F	Bond	n-C_5H_{11}
353	H	H	H	F	Bond	n-C_6H_{13}
354	H	H	H	F	Bond	n-C_7H_{15}
355	H	H	F	F	Bond	CH_3
356	H	H	F	F	Bond	C_2H_5
357	H	H	F	F	Bond	n-C_3H_7
358	H	H	F	F	Bond	n-C_4H_9
359	H	H	F	F	Bond	n-C_5H_{11}
360	H	H	F	F	Bond	n-C_6H_{13}
361	H	H	F	F	Bond	n-C_7H_{15}
362	H	F	F	F	Bond	CH_3
363	H	F	F	F	Bond	C_2H_5
364	H	F	F	F	Bond	n-C_3H_7

Example	E^1	X^1	X^2	X^3	Z	R
365	H	F	F	F	Bond	$n\text{-}C_4H_9$
366	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
367	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
368	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
369	H	F	F	F	CF_2CF_2	CH_3
370	H	F	F	F	CF_2CF_2	C_2H_5
371	H	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
372	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
373	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
374	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
375	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
376	H	F	F	F	CF_2O	CH_3
377	H	F	F	F	CF_2O	C_2H_5
378	H	F	F	F	CF_2O	$n\text{-}C_3H_7$
379	H	F	F	F	CF_2O	$n\text{-}C_4H_9$
380	H	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
381	H	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
382	H	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
383	CH_3	H	F	F	Bond	CH_3
384	CH_3	H	F	F	Bond	C_2H_5
385	CH_3	H	F	F	Bond	$n\text{-}C_3H_7$
386	CH_3	H	F	F	Bond	$n\text{-}C_4H_9$
387	CH_3	H	F	F	Bond	$n\text{-}C_5H_{11}$
388	CH_3	H	F	F	Bond	$n\text{-}C_6H_{13}$
389	CH_3	H	F	F	Bond	$n\text{-}C_7H_{15}$
390	CH_3	F	F	F	Bond	CH_3
391	CH_3	F	F	F	Bond	C_2H_5
392	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
393	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$
394	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
395	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
396	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
397	CH_3	F	F	F	CF_2CF_2	CH_3

Example	E^1	X^1	X^2	X^3	Z	R
398	CH_3	F	F	F	CF_2CF_2	C_2H_5
399	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
400	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
401	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
402	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
403	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
404	CH_3	F	F	F	CF_2O	CH_3
405	CH_3	F	F	F	CF_2O	C_2H_5
406	CH_3	F	F	F	CF_2O	$n\text{-}C_3H_7$
407	CH_3	F	F	F	CF_2O	$n\text{-}C_4H_9$
408	CH_3	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
409	CH_3	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
410	CH_3	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
411	C_2H_5	H	F	F	Bond	CH_3
412	C_2H_5	H	F	F	Bond	C_2H_5
413	C_2H_5	H	F	F	Bond	$n\text{-}C_3H_7$
414	C_2H_5	H	F	F	Bond	$n\text{-}C_4H_9$
415	C_2H_5	H	F	F	Bond	$n\text{-}C_5H_{11}$
416	C_2H_5	H	F	F	Bond	$n\text{-}C_6H_{13}$
417	C_2H_5	H	F	F	Bond	$n\text{-}C_7H_{15}$
418	C_2H_5	F	F	F	Bond	CH_3
419	C_2H_5	F	F	F	Bond	C_2H_5
420	C_2H_5	F	F	F	Bond	$n\text{-}C_3H_7$
421	C_2H_5	F	F	F	Bond	$n\text{-}C_4H_9$
422	C_2H_5	F	F	F	Bond	$n\text{-}C_5H_{11}$
423	C_2H_5	F	F	F	Bond	$n\text{-}C_6H_{13}$
424	C_2H_5	F	F	F	Bond	$n\text{-}C_7H_{15}$
425	$n\text{-}C_3H_7$	H	F	F	Bond	CH_3
426	$n\text{-}C_3H_7$	H	F	F	Bond	C_2H_5
427	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_3H_7$
428	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_4H_9$
429	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_5H_{11}$
430	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_6H_{13}$

Example	E^1	X^1	X^2	X^3	Z	R
431	n-C$_3$H$_7$	H	F	F	Bond	n-C$_7$H$_{15}$
432	n-C$_3$H$_7$	F	F	F	Bond	CH$_3$
433	n-C$_3$H$_7$	F	F	F	Bond	C$_2$H$_5$
434	n-C$_3$H$_7$	F	F	F	Bond	n-C$_3$H$_7$
435	n-C$_3$H$_7$	F	F	F	Bond	n-C$_4$H$_9$
436	n-C$_3$H$_7$	F	F	F	Bond	n-C$_5$H$_{11}$
437	n-C$_3$H$_7$	F	F	F	Bond	n-C$_6$H$_{13}$
438	n-C$_3$H$_7$	F	F	F	Bond	n-C$_7$H$_{15}$
439	n-C$_4$H$_9$	H	F	F	Bond	CH$_3$
440	n-C$_4$H$_9$	H	F	F	Bond	C$_2$H$_5$
441	n-C$_4$H$_9$	H	F	F	Bond	n-C$_3$H$_7$
442	n-C$_4$H$_9$	H	F	F	Bond	n-C$_4$H$_9$
443	n-C$_4$H$_9$	H	F	F	Bond	n-C$_5$H$_{11}$
444	n-C$_4$H$_9$	H	F	F	Bond	n-C$_6$H$_{13}$
445	n-C$_4$H$_9$	H	F	F	Bond	n-C$_7$H$_{15}$
446	n-C$_4$H$_9$	F	F	F	Bond	CH$_3$
447	n-C$_4$H$_9$	F	F	F	Bond	C$_2$H$_5$
448	n-C$_4$H$_9$	F	F	F	Bond	n-C$_3$H$_7$
449	n-C$_4$H$_9$	F	F	F	Bond	n-C$_4$H$_9$
450	n-C$_4$H$_9$	F	F	F	Bond	n-C$_5$H$_{11}$
451	n-C$_4$H$_9$	F	F	F	Bond	n-C$_6$H$_{13}$
452	n-C$_4$H$_9$	F	F	F	Bond	n-C$_7$H$_{15}$
453	n-C$_5$H$_{11}$	H	F	F	Bond	CH$_3$
454	n-C$_5$H$_{11}$	H	F	F	Bond	C$_2$H$_5$
455	n-C$_5$H$_{11}$	H	F	F	Bond	n-C$_3$H$_7$
456	n-C$_5$H$_{11}$	H	F	F	Bond	n-C$_4$H$_9$
457	n-C$_5$H$_{11}$	H	F	F	Bond	n-C$_5$H$_{11}$
458	n-C$_5$H$_{11}$	H	F	F	Bond	n-C$_6$H$_{13}$
459	n-C$_5$H$_{11}$	H	F	F	Bond	n-C$_7$H$_{15}$
460	n-C$_5$H$_{11}$	F	F	F	Bond	CH$_3$
461	n-C$_5$H$_{11}$	F	F	F	Bond	C$_2$H$_5$
462	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_3$H$_7$
463	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_4$H$_9$

Example	E^1	X^1	X^2	X^3	Z	R
464	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_5$H$_{11}$
465	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_6$H$_{13}$
466	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_7$H$_{15}$

Examples 467 - 549
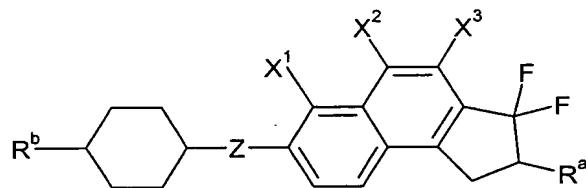
Example	R^b	X^1	X^2	X^3	Z	R^a
467	CH$_3$	H	F	F	Bond	CH$_3$
468	CH$_3$	H	F	F	Bond	C$_2$H$_5$
469	CH$_3$	H	F	F	Bond	n-C$_3$H$_7$
470	CH$_3$	H	F	F	Bond	n-C$_4$H$_9$
471	CH$_3$	H	F	F	Bond	n-C$_5$H$_{11}$
472	CH$_3$	H	F	F	Bond	n-C$_6$H$_{13}$
473	CH$_3$	H	F	F	Bond	n-C$_7$H$_{15}$
474	CH$_3$	F	F	F	Bond	CH$_3$
475	CH$_3$	F	F	F	Bond	C$_2$H$_5$
476	CH$_3$	F	F	F	Bond	n-C$_3$H$_7$
477	CH$_3$	F	F	F	Bond	n-C$_4$H$_9$
478	CH$_3$	F	F	F	Bond	n-C$_5$H$_{11}$
479	CH$_3$	F	F	F	Bond	n-C$_6$H$_{13}$
480	CH$_3$	F	F	F	Bond	n-C$_7$H$_{15}$
481	CH$_3$	F	F	F	CF$_2$CF$_2$	CH$_3$
482	CH$_3$	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
483	CH$_3$	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
484	CH$_3$	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$
485	CH$_3$	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
486	CH$_3$	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
487	CH$_3$	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$

Example	R^b	X^1	X^2	X^3	Z	R^a
488	C_2H_5	H	F	F	Bond	CH_3
489	C_2H_5	H	F	F	Bond	C_2H_5
490	C_2H_5	H	F	F	Bond	$n-C_3H_7$
491	C_2H_5	H	F	F	Bond	$n-C_4H_9$
492	C_2H_5	H	F	F	Bond	$n-C_5H_{11}$
493	C_2H_5	H	F	F	Bond	$n-C_6H_{13}$
494	C_2H_5	H	F	F	Bond	$n-C_7H_{15}$
495	C_2H_5	F	F	F	CF_2CF_2	CH_3
496	C_2H_5	F	F	F	CF_2CF_2	C_2H_5
497	C_2H_5	F	F	F	CF_2CF_2	$n-C_3H_7$
498	C_2H_5	F	F	F	CF_2CF_2	$n-C_4H_9$
499	C_2H_5	F	F	F	CF_2CF_2	$n-C_5H_{11}$
500	C_2H_5	F	F	F	CF_2CF_2	$n-C_6H_{13}$
501	C_2H_5	F	F	F	CF_2CF_2	$n-C_7H_{15}$
502	C_2H_5	F	F	F	Bond	CH_3
503	C_2H_5	F	F	F	Bond	C_2H_5
504	C_2H_5	F	F	F	Bond	$n-C_3H_7$
505	C_2H_5	F	F	F	Bond	$n-C_4H_9$
506	C_2H_5	F	F	F	Bond	$n-C_5H_{11}$
507	C_2H_5	F	F	F	Bond	$n-C_6H_{13}$
508	C_2H_5	F	F	F	Bond	$n-C_7H_{15}$
509	$n-C_3H_7$	H	F	F	Bond	CH_3
510	$n-C_3H_7$	H	F	F	Bond	C_2H_5
511	$n-C_3H_7$	H	F	F	Bond	$n-C_3H_7$
512	$n-C_3H_7$	H	F	F	Bond	$n-C_4H_9$
513	$n-C_3H_7$	H	F	F	Bond	$n-C_5H_{11}$
514	$n-C_3H_7$	H	F	F	Bond	$n-C_6H_{13}$
515	$n-C_3H_7$	H	F	F	Bond	$n-C_7H_{15}$
516	$n-C_3H_7$	F	F	F	Bond	CH_3
517	$n-C_3H_7$	F	F	F	Bond	C_2H_5
518	$n-C_3H_7$	F	F	F	Bond	$n-C_4H_9$
519	$n-C_3H_7$	F	F	F	Bond	$n-C_5H_{11}$
520	$n-C_3H_7$	F	F	F	Bond	$n-C_6H_{13}$

Example	R^b	X^1	X^2	X^3	Z	R^a
521	n-C_3H_7	F	F	F	Bond	n-C_7H_{15}
522	n-C_4H_9	H	F	F	Bond	CH_3
523	n-C_4H_9	H	F	F	Bond	C_2H_5
524	n-C_4H_9	H	F	F	Bond	n-C_3H_7
525	n-C_4H_9	H	F	F	Bond	n-C_4H_9
526	n-C_4H_9	H	F	F	Bond	n-C_5H_{11}
527	n-C_4H_9	H	F	F	Bond	n-C_6H_{13}
528	n-C_4H_9	H	F	F	Bond	n-C_7H_{15}
529	n-C_4H_9	F	F	F	Bond	CH_3
530	n-C_4H_9	F	F	F	Bond	C_2H_5
531	n-C_4H_9	F	F	F	Bond	n-C_3H_7
532	n-C_4H_9	F	F	F	Bond	n-C_4H_9
533	n-C_4H_9	F	F	F	Bond	n-C_5H_{11}
534	n-C_4H_9	F	F	F	Bond	n-C_6H_{13}
535	n-C_4H_9	F	F	F	Bond	n-C_7H_{15}
536	n-C_5H_{11}	H	F	F	Bond	CH_3
537	n-C_5H_{11}	H	F	F	Bond	C_2H_5
538	n-C_5H_{11}	H	F	F	Bond	n-C_3H_7
539	n-C_5H_{11}	H	F	F	Bond	n-C_4H_9
540	n-C_5H_{11}	H	F	F	Bond	n-C_5H_{11}
541	n-C_5H_{11}	H	F	F	Bond	n-C_6H_{13}
542	n-C_5H_{11}	H	F	F	Bond	n-C_7H_{15}
543	n-C_5H_{11}	F	F	F	Bond	CH_3
544	n-C_5H_{11}	F	F	F	Bond	C_2H_5
545	n-C_5H_{11}	F	F	F	Bond	n-C_3H_7
546	n-C_5H_{11}	F	F	F	Bond	n-C_4H_9
547	n-C_5H_{11}	F	F	F	Bond	n-C_5H_{11}
548	n-C_5H_{11}	F	F	F	Bond	n-C_6H_{13}
549	n-C_5H_{11}	F	F	F	Bond	n-C_7H_{15}

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Examples 550 - 646
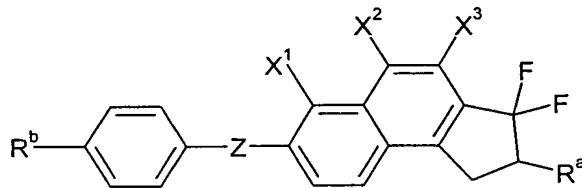
Example	R^b	X^1	X^2	X^3	Z	R^a
550	CH_3	H	F	F	Bond	CH_3
551	CH_3	H	F	F	Bond	C_2H_5
552	CH_3	H	F	F	Bond	$n\text{-}C_3H_7$
553	CH_3	H	F	F	Bond	$n\text{-}C_4H_9$
554	CH_3	H	F	F	Bond	$n\text{-}C_5H_{11}$
555	CH_3	H	F	F	Bond	$n\text{-}C_6H_{13}$
556	CH_3	H	F	F	Bond	$n\text{-}C_7H_{15}$
557	CH_3	F	F	F	Bond	CH_3
558	CH_3	F	F	F	Bond	C_2H_5
559	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
560	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$
561	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
562	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
563	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
564	CH_3	F	F	F	CF_2CF_2	CH_3
565	CH_3	F	F	F	CF_2CF_2	C_2H_5
566	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
567	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
568	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
569	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
570	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
571	CH_3	F	F	F	CF_2O	CH_3
572	CH_3	F	F	F	CF_2O	C_2H_5
573	CH_3	F	F	F	CF_2O	$n\text{-}C_3H_7$
574	CH_3	F	F	F	CF_2O	$n\text{-}C_4H_9$
575	CH_3	F	F	F	CF_2O	$n\text{-}C_5H_{11}$

Example	R^b	X^1	X^2	X^3	Z	R^a
576	CH_3	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
577	CH_3	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
578	C_2H_5	H	F	F	Bond	CH_3
579	C_2H_5	H	F	F	Bond	C_2H_5
580	C_2H_5	H	F	F	Bond	$n\text{-}C_3H_7$
581	C_2H_5	H	F	F	Bond	$n\text{-}C_4H_9$
582	C_2H_5	H	F	F	Bond	$n\text{-}C_5H_{11}$
583	C_2H_5	H	F	F	Bond	$n\text{-}C_6H_{13}$
584	C_2H_5	H	F	F	Bond	$n\text{-}C_7H_{15}$
585	C_2H_5	F	F	F	CF_2CF_2	CH_3
586	C_2H_5	F	F	F	CF_2CF_2	C_2H_5
587	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
588	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
589	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
590	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
591	C_2H_5	F	F	F	CF_2O	CH_3
592	C_2H_5	F	F	F	CF_2O	C_2H_5
593	C_2H_5	F	F	F	CF_2O	$n\text{-}C_3H_7$
594	C_2H_5	F	F	F	CF_2O	$n\text{-}C_4H_9$
595	C_2H_5	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
596	C_2H_5	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
597	C_2H_5	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
598	C_2H_5	F	F	F	Bond	CH_3
599	C_2H_5	F	F	F	Bond	C_2H_5
600	C_2H_5	F	F	F	Bond	$n\text{-}C_3H_7$
601	C_2H_5	F	F	F	Bond	$n\text{-}C_4H_9$
602	C_2H_5	F	F	F	Bond	$n\text{-}C_5H_{11}$
603	C_2H_5	F	F	F	Bond	$n\text{-}C_6H_{13}$
604	C_2H_5	F	F	F	Bond	$n\text{-}C_7H_{15}$
605	$n\text{-}C_3H_7$	H	F	F	Bond	CH_3
606	$n\text{-}C_3H_7$	H	F	F	Bond	C_2H_5
607	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_3H_7$
608	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_4H_9$

Example	R^b	X^1	X^2	X^3	Z	R^a
609	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_5H_{11}$
610	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_6H_{13}$
611	$n\text{-}C_3H_7$	H	F	F	Bond	$n\text{-}C_7H_{15}$
612	$n\text{-}C_3H_7$	F	F	F	Bond	CH_3
613	$n\text{-}C_3H_7$	F	F	F	Bond	C_2H_5
614	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_3H_7$
615	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_4H_9$
616	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_5H_{11}$
617	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_6H_{13}$
618	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_7H_{15}$
619	$n\text{-}C_4H_9$	H	F	F	Bond	CH_3
620	$n\text{-}C_4H_9$	H	F	F	Bond	C_2H_5
621	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_3H_7$
622	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_4H_9$
623	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_5H_{11}$
624	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_6H_{13}$
625	$n\text{-}C_4H_9$	H	F	F	Bond	$n\text{-}C_7H_{15}$
626	$n\text{-}C_4H_9$	F	F	F	Bond	CH_3
627	$n\text{-}C_4H_9$	F	F	F	Bond	C_2H_5
628	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_3H_7$
629	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_4H_9$
630	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_5H_{11}$
631	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_6H_{13}$
632	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_7H_{15}$
633	$n\text{-}C_5H_{11}$	H	F	F	Bond	CH_3
634	$n\text{-}C_5H_{11}$	H	F	F	Bond	C_2H_5
635	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_3H_7$
636	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_4H_9$
637	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_5H_{11}$
638	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_6H_{13}$
639	$n\text{-}C_5H_{11}$	H	F	F	Bond	$n\text{-}C_7H_{15}$
640	$n\text{-}C_5H_{11}$	F	F	F	Bond	CH_3
641	$n\text{-}C_5H_{11}$	F	F	F	Bond	C_2H_5

Example	R^b	X^1	X^2	X^3	Z	R^a
642	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_3$H$_7$
643	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_4$H$_9$
644	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_5$H$_{11}$
645	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_6$H$_{13}$
646	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_7$H$_{15}$

Examples 647 - 765
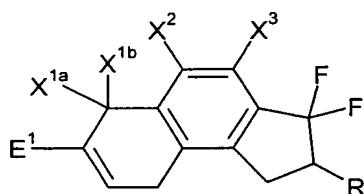
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
647	H	H	H	H	H	CH$_3$
648	H	H	H	H	H	C$_2$H$_5$
649	H	H	H	H	H	n-C$_3$H$_7$
650	H	H	H	H	H	n-C$_4$H$_9$
651	H	H	H	H	H	n-C$_5$H$_{11}$
652	H	H	H	H	H	n-C$_6$H$_{13}$
653	H	H	H	H	H	n-C$_7$H$_{15}$
654	H	H	H	H	F	CH$_3$
655	H	H	H	H	F	C$_2$H$_5$
656	H	H	H	H	F	n-C$_3$H$_7$
657	H	H	H	H	F	n-C$_4$H$_9$
658	H	H	H	H	F	n-C$_5$H$_{11}$
659	H	H	H	H	F	n-C$_6$H$_{13}$
660	H	H	H	H	F	n-C$_7$H$_{15}$
661	H	H	H	F	F	CH$_3$
662	H	H	H	F	F	C$_2$H$_5$
663	H	H	H	F	F	n-C$_3$H$_7$
664	H	H	H	F	F	n-C$_4$H$_9$
665	H	H	H	F	F	n-C$_5$H$_{11}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
666	H	H	H	F	F	$n\text{-}C_6H_{13}$
667	H	H	H	F	F	$n\text{-}C_7H_{15}$
668	H	H	F	F	F	CH_3
669	H	H	F	F	F	C_2H_5
670	H	H	F	F	F	$n\text{-}C_3H_7$
671	H	H	F	F	F	$n\text{-}C_4H_9$
672	H	H	F	F	F	$n\text{-}C_5H_{11}$
673	H	H	F	F	F	$n\text{-}C_6H_{13}$
674	H	H	F	F	F	$n\text{-}C_7H_{15}$
675	H	F	F	F	F	CH_3
676	H	F	F	F	F	C_2H_5
677	H	F	F	F	F	$n\text{-}C_3H_7$
678	H	F	F	F	F	$n\text{-}C_4H_9$
679	H	F	F	F	F	$n\text{-}C_5H_{11}$
680	H	F	F	F	F	$n\text{-}C_6H_{13}$
681	H	F	F	F	F	$n\text{-}C_7H_{15}$
682	CH_3	H	H	F	F	CH_3
683	CH_3	H	H	F	F	C_2H_5
684	CH_3	H	H	F	F	$n\text{-}C_3H_7$
685	CH_3	H	H	F	F	$n\text{-}C_4H_9$
686	CH_3	H	H	F	F	$n\text{-}C_5H_{11}$
687	CH_3	H	H	F	F	$n\text{-}C_6H_{13}$
688	CH_3	H	H	F	F	$n\text{-}C_7H_{15}$
689	CH_3	H	F	F	F	CH_3
690	CH_3	H	F	F	F	C_2H_5
691	CH_3	H	F	F	F	$n\text{-}C_3H_7$
692	CH_3	H	F	F	F	$n\text{-}C_4H_9$
693	CH_3	H	F	F	F	$n\text{-}C_5H_{11}$
694	CH_3	H	F	F	F	$n\text{-}C_6H_{13}$
695	CH_3	H	F	F	F	$n\text{-}C_7H_{15}$
696	CH_3	F	F	F	F	CH_3
697	CH_3	F	F	F	F	C_2H_5
698	CH_3	F	F	F	F	$n\text{-}C_3H_7$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
699	CH_3	F	F	F	F	$n\text{-}C_4H_9$
700	CH_3	F	F	F	F	$n\text{-}C_5H_{11}$
701	CH_3	F	F	F	F	$n\text{-}C_6H_{13}$
702	CH_3	F	F	F	F	$n\text{-}C_7H_{15}$
703	C_2H_5	H	H	F	F	CH_3
704	C_2H_5	H	H	F	F	C_2H_5
705	C_2H_5	H	H	F	F	$n\text{-}C_3H_7$
706	C_2H_5	H	H	F	F	$n\text{-}C_4H_9$
707	C_2H_5	H	H	F	F	$n\text{-}C_5H_{11}$
708	C_2H_5	H	H	F	F	$n\text{-}C_6H_{13}$
709	C_2H_5	H	H	F	F	$n\text{-}C_7H_{15}$
710	C_2H_5	H	F	F	F	CH_3
711	C_2H_5	H	F	F	F	C_2H_5
712	C_2H_5	H	F	F	F	$n\text{-}C_3H_7$
713	C_2H_5	H	F	F	F	$n\text{-}C_4H_9$
714	C_2H_5	H	F	F	F	$n\text{-}C_5H_{11}$
715	C_2H_5	H	F	F	F	$n\text{-}C_6H_{13}$
716	C_2H_5	H	F	F	F	$n\text{-}C_7H_{15}$
717	C_2H_5	F	F	F	F	CH_3
718	C_2H_5	F	F	F	F	C_2H_5
719	C_2H_5	F	F	F	F	$n\text{-}C_3H_7$
720	C_2H_5	F	F	F	F	$n\text{-}C_4H_9$
721	C_2H_5	F	F	F	F	$n\text{-}C_5H_{11}$
722	C_2H_5	F	F	F	F	$n\text{-}C_6H_{13}$
723	C_2H_5	F	F	F	F	$n\text{-}C_7H_{15}$
724	$n\text{-}C_3H_7$	H	H	F	F	CH_3
725	$n\text{-}C_3H_7$	H	H	F	F	C_2H_5
726	$n\text{-}C_3H_7$	H	H	F	F	$n\text{-}C_3H_7$
727	$n\text{-}C_3H_7$	H	H	F	F	$n\text{-}C_4H_9$
728	$n\text{-}C_3H_7$	H	H	F	F	$n\text{-}C_5H_{11}$
729	$n\text{-}C_3H_7$	H	H	F	F	$n\text{-}C_6H_{13}$
730	$n\text{-}C_3H_7$	H	H	F	F	$n\text{-}C_7H_{15}$
731	$n\text{-}C_3H_7$	F	F	F	F	CH_3

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
732	n-C$_3$H$_7$	F	F	F	F	C$_2$H$_5$
733	n-C$_3$H$_7$	F	F	F	F	n-C$_3$H$_7$
734	n-C$_3$H$_7$	F	F	F	F	n-C$_4$H$_9$
735	n-C$_3$H$_7$	F	F	F	F	n-C$_5$H$_{11}$
736	n-C$_3$H$_7$	F	F	F	F	n-C$_6$H$_{13}$
737	n-C$_3$H$_7$	F	F	F	F	n-C$_7$H$_{15}$
738	n-C$_4$H$_9$	H	H	F	F	CH$_3$
739	n-C$_4$H$_9$	H	H	F	F	C$_2$H$_5$
740	n-C$_4$H$_9$	H	H	F	F	n-C$_3$H$_7$
741	n-C$_4$H$_9$	H	H	F	F	n-C$_4$H$_9$
742	n-C$_4$H$_9$	H	H	F	F	n-C$_5$H$_{11}$
743	n-C$_4$H$_9$	H	H	F	F	n-C$_6$H$_{13}$
744	n-C$_4$H$_9$	H	H	F	F	n-C$_7$H$_{15}$
745	n-C$_4$H$_9$	F	F	F	F	CH$_3$
746	n-C$_4$H$_9$	F	F	F	F	C$_2$H$_5$
747	n-C$_4$H$_9$	F	F	F	F	n-C$_3$H$_7$
748	n-C$_4$H$_9$	F	F	F	F	n-C$_4$H$_9$
749	n-C$_4$H$_9$	F	F	F	F	n-C$_5$H$_{11}$
750	n-C$_4$H$_9$	F	F	F	F	n-C$_6$H$_{13}$
751	n-C$_4$H$_9$	F	F	F	F	n-C$_7$H$_{15}$
752	n-C$_5$H$_{11}$	H	H	F	F	CH$_3$
753	n-C$_5$H$_{11}$	H	H	F	F	C$_2$H$_5$
754	n-C$_5$H$_{11}$	H	H	F	F	n-C$_3$H$_7$
755	n-C$_5$H$_{11}$	H	H	F	F	n-C$_4$H$_9$
756	n-C$_5$H$_{11}$	H	H	F	F	n-C$_5$H$_{11}$
757	n-C$_5$H$_{11}$	H	H	F	F	n-C$_6$H$_{13}$
758	n-C$_5$H$_{11}$	H	H	F	F	n-C$_7$H$_{15}$
759	n-C$_5$H$_{11}$	F	F	F	F	CH$_3$
760	n-C$_5$H$_{11}$	F	F	F	F	C$_2$H$_5$
761	n-C$_5$H$_{11}$	F	F	F	F	n-C$_3$H$_7$
762	n-C$_5$H$_{11}$	F	F	F	F	n-C$_4$H$_9$
763	n-C$_5$H$_{11}$	F	F	F	F	n-C$_5$H$_{11}$
764	n-C$_5$H$_{11}$	F	F	F	F	n-C$_6$H$_{13}$

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Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
765	n-C$_5$H$_{11}$	F	F	F	F	n-C$_7$H$_{15}$

Examples 766 - 912
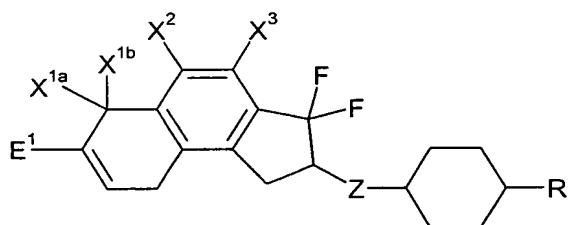
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
766	H	H	H	H	F	Bond	CH$_3$
767	H	H	H	H	F	Bond	C$_2$H$_5$
768	H	H	H	H	F	Bond	n-C$_3$H$_7$
769	H	H	H	H	F	Bond	n-C$_4$H$_9$
770	H	H	H	H	F	Bond	n-C$_5$H$_{11}$
771	H	H	H	H	F	Bond	n-C$_6$H$_{13}$
772	H	H	H	H	F	Bond	n-C$_7$H$_{15}$
773	H	H	H	F	F	Bond	CH$_3$
774	H	H	H	F	F	Bond	C$_2$H$_5$
775	H	H	H	F	F	Bond	n-C$_3$H$_7$
776	H	H	H	F	F	Bond	n-C$_4$H$_9$
777	H	H	H	F	F	Bond	n-C$_5$H$_{11}$
778	H	H	H	F	F	Bond	n-C$_6$H$_{13}$
779	H	H	H	F	F	Bond	n-C$_7$H$_{15}$
780	H	H	F	F	F	Bond	CH$_3$
781	H	H	F	F	F	Bond	C$_2$H$_5$
782	H	H	F	F	F	Bond	n-C$_3$H$_7$
783	H	H	F	F	F	Bond	n-C$_4$H$_9$
784	H	H	F	F	F	Bond	n-C$_5$H$_{11}$
785	H	H	F	F	F	Bond	n-C$_6$H$_{13}$
786	H	H	F	F	F	Bond	n-C$_7$H$_{15}$
787	H	F	F	F	F	Bond	CH$_3$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
788	H	F	F	F	F	Bond	C_2H_5
789	H	F	F	F	F	Bond	$n\text{-}C_3H_7$
790	H	F	F	F	F	Bond	$n\text{-}C_4H_9$
791	H	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
792	H	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
793	H	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
794	H	H	F	F	F	CF_2CF_2	CH_3
795	H	H	F	F	F	CF_2CF_2	C_2H_5
796	H	H	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
797	H	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
798	H	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
799	H	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
800	H	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
801	H	F	F	F	F	CF_2CF_2	CH_3
802	H	F	F	F	F	CF_2CF_2	C_2H_5
803	H	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
804	H	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
805	H	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
806	H	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
807	H	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
808	H	F	F	F	F	OCF_2	CH_3
809	H	F	F	F	F	OCF_2	C_2H_5
810	H	F	F	F	F	OCF_2	$n\text{-}C_3H_7$
811	H	F	F	F	F	OCF_2	$n\text{-}C_4H_9$
812	H	F	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
813	H	F	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
814	H	F	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
815	CH_3	H	H	F	F	Bond	CH_3
816	CH_3	H	H	F	F	Bond	C_2H_5
817	CH_3	H	H	F	F	Bond	$n\text{-}C_3H_7$
818	CH_3	H	H	F	F	Bond	$n\text{-}C_4H_9$
819	CH_3	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
820	CH_3	H	H	F	F	Bond	$n\text{-}C_6H_{13}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
821	CH$_3$	H	H	F	F	Bond	n-C$_7$H$_{15}$
822	CH$_3$	H	F	F	F	Bond	CH$_3$
823	CH$_3$	H	F	F	F	Bond	C$_2$H$_5$
824	CH$_3$	H	F	F	F	Bond	n-C$_3$H$_7$
825	CH$_3$	H	F	F	F	Bond	n-C$_4$H$_9$
826	CH$_3$	H	F	F	F	Bond	n-C$_5$H$_{11}$
827	CH$_3$	H	F	F	F	Bond	n-C$_6$H$_{13}$
828	CH$_3$	H	F	F	F	Bond	n-C$_7$H$_{15}$
829	CH$_3$	F	F	F	F	Bond	CH$_3$
830	CH$_3$	F	F	F	F	Bond	C$_2$H$_5$
831	CH$_3$	F	F	F	F	Bond	n-C$_3$H$_7$
832	CH$_3$	F	F	F	F	Bond	n-C$_4$H$_9$
833	CH$_3$	F	F	F	F	Bond	n-C$_5$H$_{11}$
834	CH$_3$	F	F	F	F	Bond	n-C$_6$H$_{13}$
835	CH$_3$	F	F	F	F	Bond	n-C$_7$H$_{15}$
836	CH$_3$	F	F	F	F	CF$_2$CF$_2$	CH$_3$
837	CH$_3$	F	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
838	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
839	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$
840	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
841	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
842	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$
843	CH$_3$	F	F	F	F	OCF$_2$	CH$_3$
844	CH$_3$	F	F	F	F	OCF$_2$	C$_2$H$_5$
845	CH$_3$	F	F	F	F	OCF$_2$	n-C$_3$H$_7$
846	CH$_3$	F	F	F	F	OCF$_2$	n-C$_4$H$_9$
847	CH$_3$	F	F	F	F	OCF$_2$	n-C$_5$H$_{11}$
848	CH$_3$	F	F	F	F	OCF$_2$	n-C$_6$H$_{13}$
849	CH$_3$	F	F	F	F	OCF$_2$	n-C$_7$H$_{15}$
850	C$_2$H$_5$	H	H	F	F	Bond	CH$_3$
851	C$_2$H$_5$	H	H	F	F	Bond	C$_2$H$_5$
852	C$_2$H$_5$	H	H	F	F	Bond	n-C$_3$H$_7$
853	C$_2$H$_5$	H	H	F	F	Bond	n-C$_4$H$_9$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
854	C_2H_5	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
855	C_2H_5	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
856	C_2H_5	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
857	C_2H_5	F	F	F	F	Bond	CH_3
858	C_2H_5	F	F	F	F	Bond	C_2H_5
859	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
860	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
861	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
862	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
863	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
864	$n\text{-}C_3H_7$	H	H	F	F	Bond	CH_3
865	$n\text{-}C_3H_7$	H	H	F	F	Bond	C_2H_5
866	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_3H_7$
867	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_4H_9$
868	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
869	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
870	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
871	$n\text{-}C_3H_7$	H	F	F	F	Bond	CH_3
872	$n\text{-}C_3H_7$	H	F	F	F	Bond	C_2H_5
873	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_3H_7$
874	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_4H_9$
875	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
876	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
877	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
878	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
879	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
880	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
881	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
882	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
883	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
884	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
885	$n\text{-}C_4H_9$	H	H	F	F	Bond	CH_3
886	$n\text{-}C_4H_9$	H	H	F	F	Bond	C_2H_5

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
887	$n-C_4H_9$	H	H	F	F	Bond	$n-C_3H_7$
888	$n-C_4H_9$	H	H	F	F	Bond	$n-C_4H_9$
889	$n-C_4H_9$	H	H	F	F	Bond	$n-C_5H_{11}$
890	$n-C_4H_9$	H	H	F	F	Bond	$n-C_6H_{13}$
891	$n-C_4H_9$	H	H	F	F	Bond	$n-C_7H_{15}$
892	$n-C_4H_9$	F	F	F	F	Bond	CH_3
893	$n-C_4H_9$	F	F	F	F	Bond	C_2H_5
894	$n-C_4H_9$	F	F	F	F	Bond	$n-C_3H_7$
895	$n-C_4H_9$	F	F	F	F	Bond	$n-C_4H_9$
896	$n-C_4H_9$	F	F	F	F	Bond	$n-C_5H_{11}$
897	$n-C_4H_9$	F	F	F	F	Bond	$n-C_6H_{13}$
898	$n-C_4H_9$	F	F	F	F	Bond	$n-C_7H_{15}$
899	$n-C_5H_{11}$	H	H	F	F	Bond	CH_3
900	$n-C_5H_{11}$	H	H	F	F	Bond	C_2H_5
901	$n-C_5H_{11}$	H	H	F	F	Bond	$n-C_3H_7$
902	$n-C_5H_{11}$	H	H	F	F	Bond	$n-C_4H_9$
903	$n-C_5H_{11}$	H	H	F	F	Bond	$n-C_5H_{11}$
904	$n-C_5H_{11}$	H	H	F	F	Bond	$n-C_6H_{13}$
905	$n-C_5H_{11}$	H	H	F	F	Bond	$n-C_7H_{15}$
906	$n-C_5H_{11}$	F	F	F	F	Bond	CH_3
907	$n-C_5H_{11}$	F	F	F	F	Bond	C_2H_5
908	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_3H_7$
909	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_4H_9$
910	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_5H_{11}$
911	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_6H_{13}$
912	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_7H_{15}$

Examples 913 - 1059
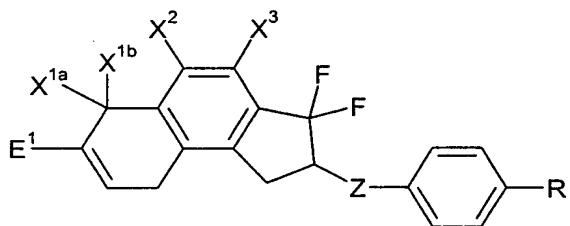
Example	E¹	X¹ᵃ	X¹ᵇ	X²	X³	Z	R
913	H	H	H	H	F	Bond	CH_3
914	H	H	H	H	F	Bond	C_2H_5
915	H	H	H	H	F	Bond	$n\text{-}C_3H_7$
916	H	H	H	H	F	Bond	$n\text{-}C_4H_9$
917	H	H	H	H	F	Bond	$n\text{-}C_5H_{11}$
918	H	H	H	H	F	Bond	$n\text{-}C_6H_{13}$
919	H	H	H	H	F	Bond	$n\text{-}C_7H_{15}$
920	H	H	H	F	F	Bond	CH_3
921	H	H	H	F	F	Bond	C_2H_5
922	H	H	H	F	F	Bond	$n\text{-}C_3H_7$
923	H	H	H	F	F	Bond	$n\text{-}C_4H_9$
924	H	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
925	H	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
926	H	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
927	H	H	F	F	F	Bond	CH_3
928	H	H	F	F	F	Bond	C_2H_5
929	H	H	F	F	F	Bond	$n\text{-}C_3H_7$
930	H	H	F	F	F	Bond	$n\text{-}C_4H_9$
931	H	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
932	H	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
933	H	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
934	H	F	F	F	F	Bond	CH_3
935	H	F	F	F	F	Bond	C_2H_5
936	H	F	F	F	F	Bond	$n\text{-}C_3H_7$
937	H	F	F	F	F	Bond	$n\text{-}C_4H_9$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
938	H	F	F	F	F	Bond	n-C$_5$H$_{11}$
939	H	F	F	F	F	Bond	n-C$_6$H$_{13}$
940	H	F	F	F	F	Bond	n-C$_7$H$_{15}$
941	H	H	F	F	F	CF$_2$CF$_2$	CH$_3$
942	H	H	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
943	H	H	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
944	H	H	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$
945	H	H	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
946	H	H	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
947	H	H	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$
948	H	F	F	F	F	CF$_2$CF$_2$	CH$_3$
949	H	F	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
950	H	F	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
951	H	F	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$
952	H	F	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
953	H	F	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
954	H	F	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$
955	H	F	F	F	F	CF$_2$O	CH$_3$
956	H	F	F	F	F	CF$_2$O	C$_2$H$_5$
957	H	F	F	F	F	CF$_2$O	n-C$_3$H$_7$
958	H	F	F	F	F	CF$_2$O	n-C$_4$H$_9$
959	H	F	F	F	F	CF$_2$O	n-C$_5$H$_{11}$
960	H	F	F	F	F	CF$_2$O	n-C$_6$H$_{13}$
961	H	F	F	F	F	CF$_2$O	n-C$_7$H$_{15}$
962	CH$_3$	H	H	F	F	Bond	CH$_3$
963	CH$_3$	H	H	F	F	Bond	C$_2$H$_5$
964	CH$_3$	H	H	F	F	Bond	n-C$_3$H$_7$
965	CH$_3$	H	H	F	F	Bond	n-C$_4$H$_9$
966	CH$_3$	H	H	F	F	Bond	n-C$_5$H$_{11}$
967	CH$_3$	H	H	F	F	Bond	n-C$_6$H$_{13}$
968	CH$_3$	H	H	F	F	Bond	n-C$_7$H$_{15}$
969	CH$_3$	H	F	F	F	Bond	CH$_3$
970	CH$_3$	H	F	F	F	Bond	C$_2$H$_5$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
971	CH_3	H	F	F	F	Bond	$n\text{-}C_3H_7$
972	CH_3	H	F	F	F	Bond	$n\text{-}C_4H_9$
973	CH_3	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
974	CH_3	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
975	CH_3	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
976	CH_3	F	F	F	F	Bond	CH_3
977	CH_3	F	F	F	F	Bond	C_2H_5
978	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
979	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
980	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
981	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
982	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
983	CH_3	F	F	F	F	CF_2CF_2	CH_3
984	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
985	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
986	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
987	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
988	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
989	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
990	CH_3	F	F	F	F	CF_2O	CH_3
991	CH_3	F	F	F	F	CF_2O	C_2H_5
992	CH_3	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
993	CH_3	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
994	CH_3	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
995	CH_3	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
996	CH_3	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
997	C_2H_5	H	H	F	F	Bond	CH_3
998	C_2H_5	H	H	F	F	Bond	C_2H_5
999	C_2H_5	H	H	F	F	Bond	$n\text{-}C_3H_7$
1000	C_2H_5	H	H	F	F	Bond	$n\text{-}C_4H_9$
1001	C_2H_5	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1002	C_2H_5	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1003	C_2H_5	H	H	F	F	Bond	$n\text{-}C_7H_{15}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1004	C_2H_5	F	F	F	F	Bond	CH_3
1005	C_2H_5	F	F	F	F	Bond	C_2H_5
1006	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
1007	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
1008	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1009	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1010	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1011	$n\text{-}C_3H_7$	H	H	F	F	Bond	CH_3
1012	$n\text{-}C_3H_7$	H	H	F	F	Bond	C_2H_5
1013	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1014	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1015	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1016	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1017	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1018	$n\text{-}C_3H_7$	H	F	F	F	Bond	CH_3
1019	$n\text{-}C_3H_7$	H	F	F	F	Bond	C_2H_5
1020	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_3H_7$
1021	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_4H_9$
1022	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
1023	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
1024	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
1025	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
1026	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
1027	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1028	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1029	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1030	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1031	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1032	$n\text{-}C_4H_9$	H	H	F	F	Bond	CH_3
1033	$n\text{-}C_4H_9$	H	H	F	F	Bond	C_2H_5
1034	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1035	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1036	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1037	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1038	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1039	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
1040	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
1041	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1042	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1043	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1044	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1045	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1046	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	CH_3
1047	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	C_2H_5
1048	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1049	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1050	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1051	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1052	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1053	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
1054	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
1055	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1056	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1057	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1058	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1059	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 1060 - 1206
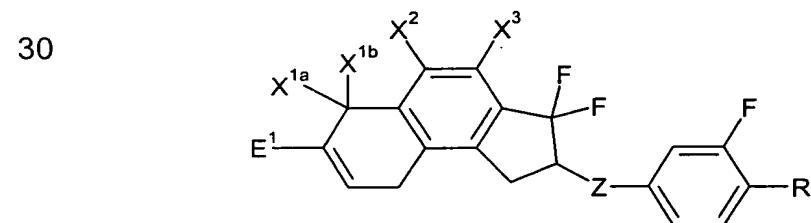
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1060	H	H	H	H	F	Bond	CH$_3$
1061	H	H	H	H	F	Bond	C$_2$H$_5$
1062	H	H	H	H	F	Bond	n-C$_3$H$_7$
1063	H	H	H	H	F	Bond	n-C$_4$H$_9$
1064	H	H	H	H	F	Bond	n-C$_5$H$_{11}$
1065	H	H	H	H	F	Bond	n-C$_6$H$_{13}$
1066	H	H	H	H	F	Bond	n-C$_7$H$_{15}$
1067	H	H	H	F	F	Bond	CH$_3$
1068	H	H	H	F	F	Bond	C$_2$H$_5$
1069	H	H	H	F	F	Bond	n-C$_3$H$_7$
1070	H	H	H	F	F	Bond	n-C$_4$H$_9$
1071	H	H	H	F	F	Bond	n-C$_5$H$_{11}$
1072	H	H	H	F	F	Bond	n-C$_6$H$_{13}$
1073	H	H	H	F	F	Bond	n-C$_7$H$_{15}$
1074	H	H	F	F	F	Bond	CH$_3$
1075	H	H	F	F	F	Bond	C$_2$H$_5$
1076	H	H	F	F	F	Bond	n-C$_3$H$_7$
1077	H	H	F	F	F	Bond	n-C$_4$H$_9$
1078	H	H	F	F	F	Bond	n-C$_5$H$_{11}$
1079	H	H	F	F	F	Bond	n-C$_6$H$_{13}$
1080	H	H	F	F	F	Bond	n-C$_7$H$_{15}$
1081	H	F	F	F	F	Bond	CH$_3$
1082	H	F	F	F	F	Bond	C$_2$H$_5$
1083	H	F	F	F	F	Bond	n-C$_3$H$_7$
1084	H	F	F	F	F	Bond	n-C$_4$H$_9$
1085	H	F	F	F	F	Bond	n-C$_5$H$_{11}$
1086	H	F	F	F	F	Bond	n-C$_6$H$_{13}$
1087	H	F	F	F	F	Bond	n-C$_7$H$_{15}$
1088	H	H	F	F	F	CF$_2$CF$_2$	CH$_3$
1089	H	H	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
1090	H	H	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
1091	H	H	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1092	H	H	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
1093	H	H	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
1094	H	H	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$
1095	H	F	F	F	F	CF$_2$CF$_2$	CH$_3$
1096	H	F	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
1097	H	F	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
1098	H	F	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$
1099	H	F	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
1100	H	F	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
1101	H	F	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$
1102	H	F	F	F	F	CF$_2$O	CH$_3$
1103	H	F	F	F	F	CF$_2$O	C$_2$H$_5$
1104	H	F	F	F	F	CF$_2$O	n-C$_3$H$_7$
1105	H	F	F	F	F	CF$_2$O	n-C$_4$H$_9$
1106	H	F	F	F	F	CF$_2$O	n-C$_5$H$_{11}$
1107	H	F	F	F	F	CF$_2$O	n-C$_6$H$_{13}$
1108	H	F	F	F	F	CF$_2$O	n-C$_7$H$_{15}$
1109	CH$_3$	H	H	F	F	Bond	CH$_3$
1110	CH$_3$	H	H	F	F	Bond	C$_2$H$_5$
1111	CH$_3$	H	H	F	F	Bond	n-C$_3$H$_7$
1112	CH$_3$	H	H	F	F	Bond	n-C$_4$H$_9$
1113	CH$_3$	H	H	F	F	Bond	n-C$_5$H$_{11}$
1114	CH$_3$	H	H	F	F	Bond	n-C$_6$H$_{13}$
1115	CH$_3$	H	H	F	F	Bond	n-C$_7$H$_{15}$
1116	CH$_3$	H	F	F	F	Bond	CH$_3$
1117	CH$_3$	H	F	F	F	Bond	C$_2$H$_5$
1118	CH$_3$	H	F	F	F	Bond	n-C$_3$H$_7$
1119	CH$_3$	H	F	F	F	Bond	n-C$_4$H$_9$
1120	CH$_3$	H	F	F	F	Bond	n-C$_5$H$_{11}$
1121	CH$_3$	H	F	F	F	Bond	n-C$_6$H$_{13}$
1122	CH$_3$	H	F	F	F	Bond	n-C$_7$H$_{15}$
1123	CH$_3$	F	F	F	F	Bond	CH$_3$
1124	CH$_3$	F	F	F	F	Bond	C$_2$H$_5$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1125	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
1126	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
1127	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1128	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1129	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1130	CH_3	F	F	F	F	CF_2CF_2	CH_3
1131	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
1132	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1133	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1134	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1135	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1136	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1137	CH_3	F	F	F	F	CF_2O	CH_3
1138	CH_3	F	F	F	F	CF_2O	C_2H_5
1139	CH_3	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
1140	CH_3	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
1141	CH_3	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
1142	CH_3	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
1143	CH_3	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
1144	C_2H_5	H	H	F	F	Bond	CH_3
1145	C_2H_5	H	H	F	F	Bond	C_2H_5
1146	C_2H_5	H	H	F	F	Bond	$n\text{-}C_3H_7$
1147	C_2H_5	H	H	F	F	Bond	$n\text{-}C_4H_9$
1148	C_2H_5	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1149	C_2H_5	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1150	C_2H_5	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1151	C_2H_5	F	F	F	F	Bond	CH_3
1152	C_2H_5	F	F	F	F	Bond	C_2H_5
1153	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
1154	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
1155	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1156	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1157	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1158	$n\text{-}C_3H_7$	H	H	F	F	Bond	CH_3
1159	$n\text{-}C_3H_7$	H	H	F	F	Bond	C_2H_5
1160	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1161	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1162	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1163	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1164	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1165	$n\text{-}C_3H_7$	H	F	F	F	Bond	CH_3
1166	$n\text{-}C_3H_7$	H	F	F	F	Bond	C_2H_5
1167	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_3H_7$
1168	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_4H_9$
1169	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
1170	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
1171	$n\text{-}C_3H_7$	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
1172	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
1173	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
1174	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1175	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1176	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1177	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1178	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1179	$n\text{-}C_4H_9$	H	H	F	F	Bond	CH_3
1180	$n\text{-}C_4H_9$	H	H	F	F	Bond	C_2H_5
1181	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1182	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1183	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1184	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1185	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1186	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
1187	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
1188	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1189	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1190	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1191	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1192	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1193	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	CH_3
1194	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	C_2H_5
1195	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1196	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1197	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1198	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1199	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1200	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
1201	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
1202	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1203	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1204	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1205	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1206	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 1207 - 1304
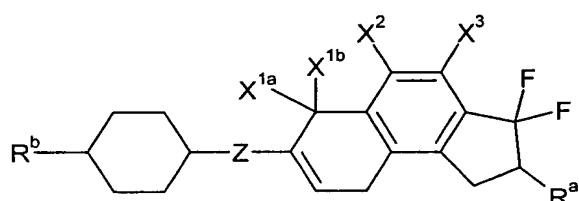
Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1207	CH_3	H	H	F	F	Bond	CH_3
1208	CH_3	H	H	F	F	Bond	C_2H_5
1209	CH_3	H	H	F	F	Bond	$n\text{-}C_3H_7$
1210	CH_3	H	H	F	F	Bond	$n\text{-}C_4H_9$
1211	CH_3	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1212	CH_3	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1213	CH_3	H	H	F	F	Bond	$n\text{-}C_7H_{15}$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1214	CH_3	H	F	F	F	Bond	CH_3
1215	CH_3	H	F	F	F	Bond	C_2H_5
1216	CH_3	H	F	F	F	Bond	$n\text{-}C_3H_7$
1217	CH_3	H	F	F	F	Bond	$n\text{-}C_4H_9$
1218	CH_3	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
1219	CH_3	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
1220	CH_3	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
1221	CH_3	F	F	F	F	Bond	CH_3
1222	CH_3	F	F	F	F	Bond	C_2H_5
1223	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
1224	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
1225	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1226	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1227	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1228	CH_3	H	F	F	F	CF_2CF_2	CH_3
1229	CH_3	H	F	F	F	CF_2CF_2	C_2H_5
1230	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1231	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1232	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1233	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1234	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1235	CH_3	F	F	F	F	CF_2CF_2	CH_3
1236	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
1237	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1238	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1239	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1240	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1241	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1242	C_2H_5	H	H	F	F	Bond	CH_3
1243	C_2H_5	H	H	F	F	Bond	C_2H_5
1244	C_2H_5	H	H	F	F	Bond	$n\text{-}C_3H_7$
1245	C_2H_5	H	H	F	F	Bond	$n\text{-}C_4H_9$
1246	C_2H_5	H	H	F	F	Bond	$n\text{-}C_5H_{11}$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1247	C_2H_5	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1248	C_2H_5	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1249	C_2H_5	F	F	F	F	CF_2CF_2	CH_3
1250	C_2H_5	F	F	F	F	CF_2CF_2	C_2H_5
1251	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1252	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1253	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1254	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1255	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1256	C_2H_5	F	F	F	F	Bond	CH_3
1257	C_2H_5	F	F	F	F	Bond	C_2H_5
1258	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
1259	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
1260	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1261	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1262	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1263	$n\text{-}C_3H_7$	H	H	F	F	Bond	CH_3
1264	$n\text{-}C_3H_7$	H	H	F	F	Bond	C_2H_5
1265	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1266	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1267	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1268	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1269	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1270	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
1271	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
1272	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1273	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1274	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1275	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1276	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1277	$n\text{-}C_4H_9$	H	H	F	F	Bond	CH_3
1278	$n\text{-}C_4H_9$	H	H	F	F	Bond	C_2H_5
1279	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_3H_7$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1280	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1281	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1282	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1283	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1284	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
1285	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
1286	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1287	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1288	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1289	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1290	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1291	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	CH_3
1292	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	C_2H_5
1293	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1294	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1295	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1296	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1297	$n\text{-}C_5H_{11}$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1298	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
1299	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
1300	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1301	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1302	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1303	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1304	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 1305 - 1423
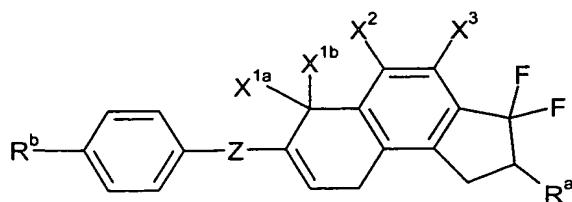
Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1305	CH_3	H	H	F	F	Bond	CH_3
1306	CH_3	H	H	F	F	Bond	C_2H_5
1307	CH_3	H	H	F	F	Bond	$n\text{-}C_3H_7$
1308	CH_3	H	H	F	F	Bond	$n\text{-}C_4H_9$
1309	CH_3	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1310	CH_3	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1311	CH_3	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1312	CH_3	H	F	F	F	Bond	CH_3
1313	CH_3	H	F	F	F	Bond	C_2H_5
1314	CH_3	H	F	F	F	Bond	$n\text{-}C_3H_7$
1315	CH_3	H	F	F	F	Bond	$n\text{-}C_4H_9$
1316	CH_3	H	F	F	F	Bond	$n\text{-}C_5H_{11}$
1317	CH_3	H	F	F	F	Bond	$n\text{-}C_6H_{13}$
1318	CH_3	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
1319	CH_3	F	F	F	F	Bond	CH_3
1320	CH_3	F	F	F	F	Bond	C_2H_5
1321	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
1322	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
1323	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1324	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1325	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1326	CH_3	H	F	F	F	CF_2CF_2	CH_3
1327	CH_3	H	F	F	F	CF_2CF_2	C_2H_5
1328	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1329	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1330	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1331	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1332	CH_3	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1333	CH_3	F	F	F	F	CF_2CF_2	CH_3
1334	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
1335	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1336	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1337	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1338	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1339	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1340	CH_3	H	F	F	F	OCF_2	CH_3
1341	CH_3	H	F	F	F	OCF_2	C_2H_5
1342	CH_3	H	F	F	F	OCF_2	$n\text{-}C_3H_7$
1343	CH_3	H	F	F	F	OCF_2	$n\text{-}C_4H_9$
1344	CH_3	H	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
1345	CH_3	H	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
1346	CH_3	H	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
1347	CH_3	F	F	F	F	OCF_2	CH_3
1348	CH_3	F	F	F	F	OCF_2	C_2H_5
1349	CH_3	F	F	F	F	OCF_2	$n\text{-}C_3H_7$
1350	CH_3	F	F	F	F	OCF_2	$n\text{-}C_4H_9$
1351	CH_3	F	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
1352	CH_3	F	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
1353	CH_3	F	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
1354	C_2H_5	H	H	F	F	Bond	CH_3
1355	C_2H_5	H	H	F	F	Bond	C_2H_5
1356	C_2H_5	H	H	F	F	Bond	$n\text{-}C_3H_7$
1357	C_2H_5	H	H	F	F	Bond	$n\text{-}C_4H_9$
1358	C_2H_5	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1359	C_2H_5	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1360	C_2H_5	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1361	C_2H_5	F	F	F	F	CF_2CF_2	CH_3
1362	C_2H_5	F	F	F	F	CF_2CF_2	C_2H_5
1363	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1364	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1365	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1366	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1367	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1368	C_2H_5	F	F	F	F	OCF_2	CH_3
1369	C_2H_5	F	F	F	F	OCF_2	C_2H_5

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1370	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_3H_7$
1371	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_4H_9$
1372	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
1373	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
1374	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
1375	C_2H_5	F	F	F	F	Bond	CH_3
1376	C_2H_5	F	F	F	F	Bond	C_2H_5
1377	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
1378	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
1379	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1380	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1381	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1382	$n\text{-}C_3H_7$	H	H	F	F	Bond	CH_3
1383	$n\text{-}C_3H_7$	H	H	F	F	Bond	C_2H_5
1384	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1385	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1386	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1387	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1388	$n\text{-}C_3H_7$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$
1389	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
1390	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
1391	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
1392	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
1393	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1394	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1395	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1396	$n\text{-}C_4H_9$	H	H	F	F	Bond	CH_3
1397	$n\text{-}C_4H_9$	H	H	F	F	Bond	C_2H_5
1398	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_3H_7$
1399	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_4H_9$
1400	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_5H_{11}$
1401	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_6H_{13}$
1402	$n\text{-}C_4H_9$	H	H	F	F	Bond	$n\text{-}C_7H_{15}$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
1403	n-C$_4$H$_9$	F	F	F	F	Bond	CH$_3$
1404	n-C$_4$H$_9$	F	F	F	F	Bond	C$_2$H$_5$
1405	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_3$H$_7$
1406	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_4$H$_9$
1407	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_5$H$_{11}$
1408	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_6$H$_{13}$
1409	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_7$H$_{15}$
1410	n-C$_5$H$_{11}$	H	H	F	F	Bond	CH$_3$
1411	n-C$_5$H$_{11}$	H	H	F	F	Bond	C$_2$H$_5$
1412	n-C$_5$H$_{11}$	H	H	F	F	Bond	n-C$_3$H$_7$
1413	n-C$_5$H$_{11}$	H	H	F	F	Bond	n-C$_4$H$_9$
1414	n-C$_5$H$_{11}$	H	H	F	F	Bond	n-C$_5$H$_{11}$
1415	n-C$_5$H$_{11}$	H	H	F	F	Bond	n-C$_6$H$_{13}$
1416	n-C$_5$H$_{11}$	H	H	F	F	Bond	n-C$_7$H$_{15}$
1417	n-C$_5$H$_{11}$	F	F	F	F	Bond	CH$_3$
1418	n-C$_5$H$_{11}$	F	F	F	F	Bond	C$_2$H$_5$
1419	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_3$H$_7$
1420	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_4$H$_9$
1421	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_5$H$_{11}$
1422	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_6$H$_{13}$
1423	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_7$H$_{15}$

Examples 1424 - 1507
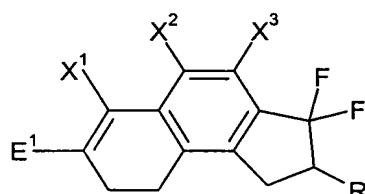
Example	E^1	X^1	X^2	X^3	R
1424	H	H	F	F	CH$_3$
1425	H	H	F	F	C$_2$H$_5$

Example	E^1	X^1	X^2	X^3	R
1426	H	H	F	F	n-C$_3$H$_7$
1427	H	H	F	F	n-C$_4$H$_9$
1428	H	H	F	F	n-C$_5$H$_{11}$
1429	H	H	F	F	n-C$_6$H$_{13}$
1430	H	H	F	F	n-C$_7$H$_{15}$
1431	H	F	F	F	CH$_3$
1432	H	F	F	F	C$_2$H$_5$
1433	H	F	F	F	n-C$_3$H$_7$
1434	H	F	F	F	n-C$_4$H$_9$
1435	H	F	F	F	n-C$_5$H$_{11}$
1436	H	F	F	F	n-C$_6$H$_{13}$
1437	H	F	F	F	n-C$_7$H$_{15}$
1438	CH$_3$	H	F	F	CH$_3$
1439	CH$_3$	H	F	F	C$_2$H$_5$
1440	CH$_3$	H	F	F	n-C$_3$H$_7$
1441	CH$_3$	H	F	F	n-C$_4$H$_9$
1442	CH$_3$	H	F	F	n-C$_5$H$_{11}$
1443	CH$_3$	H	F	F	n-C$_6$H$_{13}$
1444	CH$_3$	H	F	F	n-C$_7$H$_{15}$
1445	CH$_3$	F	F	F	CH$_3$
1446	CH$_3$	F	F	F	C$_2$H$_5$
1447	CH$_3$	F	F	F	n-C$_3$H$_7$
1448	CH$_3$	F	F	F	n-C$_4$H$_9$
1449	CH$_3$	F	F	F	n-C$_5$H$_{11}$
1450	CH$_3$	F	F	F	n-C$_6$H$_{13}$
1451	CH$_3$	F	F	F	n-C$_7$H$_{15}$
1452	C$_2$H$_5$	H	F	F	CH$_3$
1453	C$_2$H$_5$	H	F	F	C$_2$H$_5$
1454	C$_2$H$_5$	H	F	F	n-C$_3$H$_7$
1455	C$_2$H$_5$	H	F	F	n-C$_4$H$_9$
1456	C$_2$H$_5$	H	F	F	n-C$_5$H$_{11}$
1457	C$_2$H$_5$	H	F	F	n-C$_6$H$_{13}$
1458	C$_2$H$_5$	H	F	F	n-C$_7$H$_{15}$

Example	E^1	X^1	X^2	X^3	R
1459	C$_2$H$_5$	F	F	F	CH$_3$
1460	C$_2$H$_5$	F	F	F	C$_2$H$_5$
1461	C$_2$H$_5$	F	F	F	n-C$_3$H$_7$
1462	C$_2$H$_5$	F	F	F	n-C$_4$H$_9$
1463	C$_2$H$_5$	F	F	F	n-C$_5$H$_{11}$
1464	C$_2$H$_5$	F	F	F	n-C$_6$H$_{13}$
1465	C$_2$H$_5$	F	F	F	n-C$_7$H$_{15}$
1466	n-C$_3$H$_7$	H	F	F	CH$_3$
1467	n-C$_3$H$_7$	H	F	F	C$_2$H$_5$
1468	n-C$_3$H$_7$	H	F	F	n-C$_3$H$_7$
1469	n-C$_3$H$_7$	H	F	F	n-C$_4$H$_9$
1470	n-C$_3$H$_7$	H	F	F	n-C$_5$H$_{11}$
1471	n-C$_3$H$_7$	H	F	F	n-C$_6$H$_{13}$
1472	n-C$_3$H$_7$	H	F	F	n-C$_7$H$_{15}$
1473	n-C$_3$H$_7$	F	F	F	CH$_3$
1474	n-C$_3$H$_7$	F	F	F	C$_2$H$_5$
1475	n-C$_3$H$_7$	F	F	F	n-C$_3$H$_7$
1476	n-C$_3$H$_7$	F	F	F	n-C$_4$H$_9$
1477	n-C$_3$H$_7$	F	F	F	n-C$_5$H$_{11}$
1478	n-C$_3$H$_7$	F	F	F	n-C$_6$H$_{13}$
1479	n-C$_3$H$_7$	F	F	F	n-C$_7$H$_{15}$
1480	n-C$_4$H$_9$	H	F	F	CH$_3$
1481	n-C$_4$H$_9$	H	F	F	C$_2$H$_5$
1482	n-C$_4$H$_9$	H	F	F	n-C$_3$H$_7$
1483	n-C$_4$H$_9$	H	F	F	n-C$_4$H$_9$
1484	n-C$_4$H$_9$	H	F	F	n-C$_5$H$_{11}$
1485	n-C$_4$H$_9$	H	F	F	n-C$_6$H$_{13}$
1486	n-C$_4$H$_9$	H	F	F	n-C$_7$H$_{15}$
1487	n-C$_4$H$_9$	F	F	F	CH$_3$
1488	n-C$_4$H$_9$	F	F	F	C$_2$H$_5$
1489	n-C$_4$H$_9$	F	F	F	n-C$_3$H$_7$
1490	n-C$_4$H$_9$	F	F	F	n-C$_4$H$_9$
1491	n-C$_4$H$_9$	F	F	F	n-C$_5$H$_{11}$

Example	E^1	X^1	X^2	X^3	R
1492	n-C$_4$H$_9$	F	F	F	n-C$_6$H$_{13}$
1493	n-C$_4$H$_9$	F	F	F	n-C$_7$H$_{15}$
1494	n-C$_5$H$_{11}$	H	F	F	CH$_3$
1495	n-C$_5$H$_{11}$	H	F	F	C$_2$H$_5$
1496	n-C$_5$H$_{11}$	H	F	F	n-C$_3$H$_7$
1497	n-C$_5$H$_{11}$	H	F	F	n-C$_4$H$_9$
1498	n-C$_5$H$_{11}$	H	F	F	n-C$_5$H$_{11}$
1499	n-C$_5$H$_{11}$	H	F	F	n-C$_6$H$_{13}$
1500	n-C$_5$H$_{11}$	H	F	F	n-C$_7$H$_{15}$
1501	n-C$_5$H$_{11}$	F	F	F	CH$_3$
1502	n-C$_5$H$_{11}$	F	F	F	C$_2$H$_5$
1503	n-C$_5$H$_{11}$	F	F	F	n-C$_3$H$_7$
1504	n-C$_5$H$_{11}$	F	F	F	n-C$_4$H$_9$
1505	n-C$_5$H$_{11}$	F	F	F	n-C$_5$H$_{11}$
1506	n-C$_5$H$_{11}$	F	F	F	n-C$_6$H$_{13}$
1507	n-C$_5$H$_{11}$	F	F	F	n-C$_7$H$_{15}$

Examples 1508 - 1577
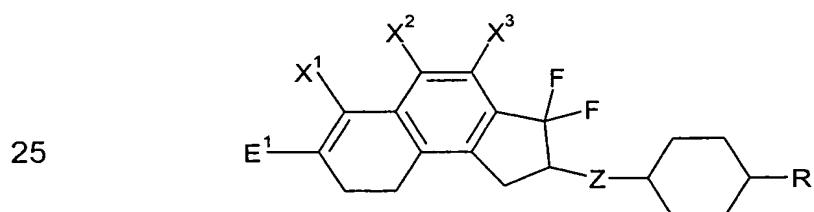
Example	E^1	X^1	X^2	X^3	Z	R
1508	H	F	F	F	Bond	CH$_3$
1509	H	F	F	F	Bond	C$_2$H$_5$
1510	H	F	F	F	Bond	n-C$_3$H$_7$
1511	H	F	F	F	Bond	n-C$_4$H$_9$
1512	H	F	F	F	Bond	n-C$_5$H$_{11}$
1513	H	F	F	F	Bond	n-C$_6$H$_{13}$

Example	E^1	X^1	X^2	X^3	Z	R
1514	H	F	F	F	Bond	$n\text{-}C_7H_{15}$
1515	H	F	F	F	CF_2CF_2	CH_3
1516	H	F	F	F	CF_2CF_2	C_2H_5
1517	H	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1518	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1519	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1520	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1521	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1522	H	F	F	F	OCF_2	CH_3
1523	H	F	F	F	OCF_2	C_2H_5
1524	H	F	F	F	OCF_2	$n\text{-}C_3H_7$
1525	H	F	F	F	OCF_2	$n\text{-}C_4H_9$
1526	H	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
1527	H	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
1528	H	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
1529	CH_3	F	F	F	Bond	CH_3
1530	CH_3	F	F	F	Bond	C_2H_5
1531	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
1532	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$
1533	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
1534	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
1535	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
1536	CH_3	F	F	F	CF_2CF_2	CH_3
1537	CH_3	F	F	F	CF_2CF_2	C_2H_5
1538	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1539	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1540	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1541	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1542	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1543	CH_3	F	F	F	OCF_2	CH_3
1544	CH_3	F	F	F	OCF_2	C_2H_5
1545	CH_3	F	F	F	OCF_2	$n\text{-}C_3H_7$
1546	CH_3	F	F	F	OCF_2	$n\text{-}C_4H_9$

Example	E^1	X^1	X^2	X^3	Z	R
1547	CH$_3$	F	F	F	OCF$_2$	n-C$_5$H$_{11}$
1548	CH$_3$	F	F	F	OCF$_2$	n-C$_6$H$_{13}$
1549	CH$_3$	F	F	F	OCF$_2$	n-C$_7$H$_{15}$
1550	C$_2$H$_5$	F	F	F	Bond	CH$_3$
1551	C$_2$H$_5$	F	F	F	Bond	C$_2$H$_5$
1552	C$_2$H$_5$	F	F	F	Bond	n-C$_3$H$_7$
1553	C$_2$H$_5$	F	F	F	Bond	n-C$_4$H$_9$
1554	C$_2$H$_5$	F	F	F	Bond	n-C$_5$H$_{11}$
1555	C$_2$H$_5$	F	F	F	Bond	n-C$_6$H$_{13}$
1556	C$_2$H$_5$	F	F	F	Bond	n-C$_7$H$_{15}$
1557	n-C$_3$H$_7$	F	F	F	Bond	CH$_3$
1558	n-C$_3$H$_7$	F	F	F	Bond	C$_2$H$_5$
1559	n-C$_3$H$_7$	F	F	F	Bond	n-C$_3$H$_7$
1560	n-C$_3$H$_7$	F	F	F	Bond	n-C$_4$H$_9$
1561	n-C$_3$H$_7$	F	F	F	Bond	n-C$_5$H$_{11}$
1562	n-C$_3$H$_7$	F	F	F	Bond	n-C$_6$H$_{13}$
1563	n-C$_3$H$_7$	F	F	F	Bond	n-C$_7$H$_{15}$
1564	n-C$_4$H$_9$	F	F	F	Bond	CH$_3$
1565	n-C$_4$H$_9$	F	F	F	Bond	C$_2$H$_5$
1566	n-C$_4$H$_9$	F	F	F	Bond	n-C$_3$H$_7$
1567	n-C$_4$H$_9$	F	F	F	Bond	n-C$_4$H$_9$
1568	n-C$_4$H$_9$	F	F	F	Bond	n-C$_5$H$_{11}$
1569	n-C$_4$H$_9$	F	F	F	Bond	n-C$_6$H$_{13}$
1570	n-C$_4$H$_9$	F	F	F	Bond	n-C$_7$H$_{15}$
1571	n-C$_5$H$_{11}$	F	F	F	Bond	CH$_3$
1572	n-C$_5$H$_{11}$	F	F	F	Bond	C$_2$H$_5$
1573	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_3$H$_7$
1574	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_4$H$_9$
1575	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_5$H$_{11}$
1576	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_6$H$_{13}$
1577	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_7$H$_{15}$

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Examples 1578 - 1647
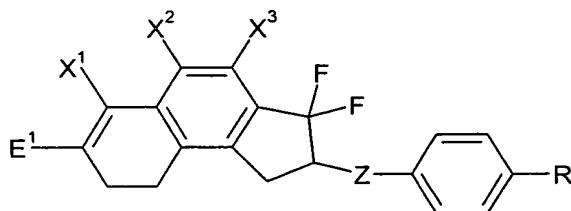
Example	E¹	X¹	X²	X³	Z	R
1578	H	F	F	F	Bond	CH_3
1579	H	F	F	F	Bond	C_2H_5
1580	H	F	F	F	Bond	$n-C_3H_7$
1581	H	F	F	F	Bond	$n-C_4H_9$
1582	H	F	F	F	Bond	$n-C_5H_{11}$
1583	H	F	F	F	Bond	$n-C_6H_{13}$
1584	H	F	F	F	Bond	$n-C_7H_{15}$
1585	H	F	F	F	CF_2CF_2	CH_3
1586	H	F	F	F	CF_2CF_2	C_2H_5
1587	H	F	F	F	CF_2CF_2	$n-C_3H_7$
1588	H	F	F	F	CF_2CF_2	$n-C_4H_9$
1589	H	F	F	F	CF_2CF_2	$n-C_5H_{11}$
1590	H	F	F	F	CF_2CF_2	$n-C_6H_{13}$
1591	H	F	F	F	CF_2CF_2	$n-C_7H_{15}$
1592	H	F	F	F	CF_2O	CH_3
1593	H	F	F	F	CF_2O	C_2H_5
1594	H	F	F	F	CF_2O	$n-C_3H_7$
1595	H	F	F	F	CF_2O	$n-C_4H_9$
1596	H	F	F	F	CF_2O	$n-C_5H_{11}$
1597	H	F	F	F	CF_2O	$n-C_6H_{13}$
1598	H	F	F	F	CF_2O	$n-C_7H_{15}$
1599	CH_3	F	F	F	Bond	CH_3
1600	CH_3	F	F	F	Bond	C_2H_5
1601	CH_3	F	F	F	Bond	$n-C_3H_7$
1602	CH_3	F	F	F	Bond	$n-C_4H_9$

Example	E^1	X^1	X^2	X^3	Z	R
1603	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
1604	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
1605	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
1606	CH_3	F	F	F	CF_2CF_2	CH_3
1607	CH_3	F	F	F	CF_2CF_2	C_2H_5
1608	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1609	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1610	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1611	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1612	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1613	CH_3	F	F	F	CF_2O	CH_3
1614	CH_3	F	F	F	CF_2O	C_2H_5
1615	CH_3	F	F	F	CF_2O	$n\text{-}C_3H_7$
1616	CH_3	F	F	F	CF_2O	$n\text{-}C_4H_9$
1617	CH_3	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
1618	CH_3	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
1619	CH_3	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
1620	C_2H_5	F	F	F	Bond	CH_3
1621	C_2H_5	F	F	F	Bond	C_2H_5
1622	C_2H_5	F	F	F	Bond	$n\text{-}C_3H_7$
1623	C_2H_5	F	F	F	Bond	$n\text{-}C_4H_9$
1624	C_2H_5	F	F	F	Bond	$n\text{-}C_5H_{11}$
1625	C_2H_5	F	F	F	Bond	$n\text{-}C_6H_{13}$
1626	C_2H_5	F	F	F	Bond	$n\text{-}C_7H_{15}$
1627	$n\text{-}C_3H_7$	F	F	F	Bond	CH_3
1628	$n\text{-}C_3H_7$	F	F	F	Bond	C_2H_5
1629	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_3H_7$
1630	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_4H_9$
1631	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_5H_{11}$
1632	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_6H_{13}$
1633	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_7H_{15}$
1634	$n\text{-}C_4H_9$	F	F	F	Bond	CH_3
1635	$n\text{-}C_4H_9$	F	F	F	Bond	C_2H_5

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Example	E^1	X^1	X^2	X^3	Z	R
1636	n-C$_4$H$_9$	F	F	F	Bond	n-C$_3$H$_7$
1637	n-C$_4$H$_9$	F	F	F	Bond	n-C$_4$H$_9$
1638	n-C$_4$H$_9$	F	F	F	Bond	n-C$_5$H$_{11}$
1639	n-C$_4$H$_9$	F	F	F	Bond	n-C$_6$H$_{13}$
1640	n-C$_4$H$_9$	F	F	F	Bond	n-C$_7$H$_{15}$
1641	n-C$_5$H$_{11}$	F	F	F	Bond	CH$_3$
1642	n-C$_5$H$_{11}$	F	F	F	Bond	C$_2$H$_5$
1643	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_3$H$_7$
1644	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_4$H$_9$
1645	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_5$H$_{11}$
1646	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_6$H$_{13}$
1647	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_7$H$_{15}$

Examples 1648 - 1717
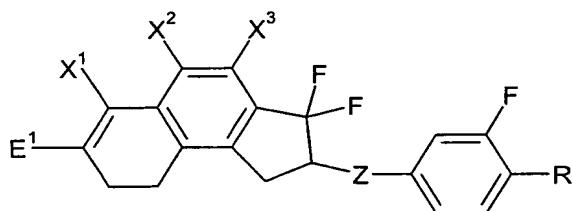
Example	E^1	X^1	X^2	X^3	Z	R
1648	H	F	F	F	Bond	CH$_3$
1649	H	F	F	F	Bond	C$_2$H$_5$
1650	H	F	F	F	Bond	n-C$_3$H$_7$
1651	H	F	F	F	Bond	n-C$_4$H$_9$
1652	H	F	F	F	Bond	n-C$_5$H$_{11}$
1653	H	F	F	F	Bond	n-C$_6$H$_{13}$
1654	H	F	F	F	Bond	n-C$_7$H$_{15}$
1655	H	F	F	F	CF$_2$CF$_2$	CH$_3$
1656	H	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
1657	H	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$

Example	E^1	X^1	X^2	X^3	Z	R
1658	H	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1659	H	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1660	H	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1661	H	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1662	H	F	F	F	CF_2O	CH_3
1663	H	F	F	F	CF_2O	C_2H_5
1664	H	F	F	F	CF_2O	$n\text{-}C_3H_7$
1665	H	F	F	F	CF_2O	$n\text{-}C_4H_9$
1666	H	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
1667	H	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
1668	H	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
1669	CH_3	F	F	F	Bond	CH_3
1670	CH_3	F	F	F	Bond	C_2H_5
1671	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
1672	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$
1673	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
1674	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
1675	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
1676	CH_3	F	F	F	CF_2CF_2	CH_3
1677	CH_3	F	F	F	CF_2CF_2	C_2H_5
1678	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1679	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1680	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1681	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1682	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1683	CH_3	F	F	F	CF_2O	CH_3
1684	CH_3	F	F	F	CF_2O	C_2H_5
1685	CH_3	F	F	F	CF_2O	$n\text{-}C_3H_7$
1686	CH_3	F	F	F	CF_2O	$n\text{-}C_4H_9$
1687	CH_3	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
1688	CH_3	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
1689	CH_3	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
1690	C_2H_5	F	F	F	Bond	CH_3

Example	E^1	X^1	X^2	X^3	Z	R
1691	C$_2$H$_5$	F	F	F	Bond	C$_2$H$_5$
1692	C$_2$H$_5$	F	F	F	Bond	n-C$_3$H$_7$
1693	C$_2$H$_5$	F	F	F	Bond	n-C$_4$H$_9$
1694	C$_2$H$_5$	F	F	F	Bond	n-C$_5$H$_{11}$
1695	C$_2$H$_5$	F	F	F	Bond	n-C$_6$H$_{13}$
1696	C$_2$H$_5$	F	F	F	Bond	n-C$_7$H$_{15}$
1697	n-C$_3$H$_7$	F	F	F	Bond	CH$_3$
1698	n-C$_3$H$_7$	F	F	F	Bond	C$_2$H$_5$
1699	n-C$_3$H$_7$	F	F	F	Bond	n-C$_3$H$_7$
1700	n-C$_3$H$_7$	F	F	F	Bond	n-C$_4$H$_9$
1701	n-C$_3$H$_7$	F	F	F	Bond	n-C$_5$H$_{11}$
1702	n-C$_3$H$_7$	F	F	F	Bond	n-C$_6$H$_{13}$
1703	n-C$_3$H$_7$	F	F	F	Bond	n-C$_7$H$_{15}$
1704	n-C$_4$H$_9$	F	F	F	Bond	CH$_3$
1705	n-C$_4$H$_9$	F	F	F	Bond	C$_2$H$_5$
1706	n-C$_4$H$_9$	F	F	F	Bond	n-C$_3$H$_7$
1707	n-C$_4$H$_9$	F	F	F	Bond	n-C$_4$H$_9$
1708	n-C$_4$H$_9$	F	F	F	Bond	n-C$_5$H$_{11}$
1709	n-C$_4$H$_9$	F	F	F	Bond	n-C$_6$H$_{13}$
1710	n-C$_4$H$_9$	F	F	F	Bond	n-C$_7$H$_{15}$
1711	n-C$_5$H$_{11}$	F	F	F	Bond	CH$_3$
1712	n-C$_5$H$_{11}$	F	F	F	Bond	C$_2$H$_5$
1713	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_3$H$_7$
1714	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_4$H$_9$
1715	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_5$H$_{11}$
1716	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_6$H$_{13}$
1717	n-C$_5$H$_{11}$	F	F	F	Bond	n-C$_7$H$_{15}$

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Examples 1718 - 1766

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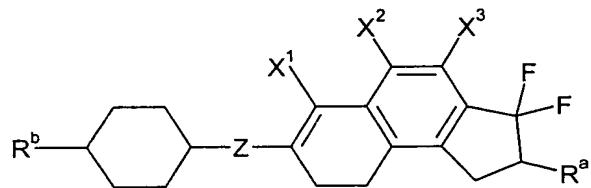
Example	R^b	X^1	X^2	X^3	Z	R^a
1718	CH_3	F	F	F	Bond	CH_3
1719	CH_3	F	F	F	Bond	C_2H_5
1720	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
1721	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$
1722	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
1723	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
1724	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
1725	CH_3	F	F	F	CF_2CF_2	CH_3
1726	CH_3	F	F	F	CF_2CF_2	C_2H_5
1727	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1728	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1729	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1730	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1731	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1732	C_2H_5	F	F	F	CF_2CF_2	CH_3
1733	C_2H_5	F	F	F	CF_2CF_2	C_2H_5
1734	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1735	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1736	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1737	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1738	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1739	C_2H_5	F	F	F	Bond	CH_3
1740	C_2H_5	F	F	F	Bond	C_2H_5
1741	C_2H_5	F	F	F	Bond	$n\text{-}C_3H_7$
1742	C_2H_5	F	F	F	Bond	$n\text{-}C_4H_9$
1743	C_2H_5	F	F	F	Bond	$n\text{-}C_5H_{11}$

Example	R^b	X^1	X^2	X^3	Z	R^a
1744	C_2H_5	F	F	F	Bond	$n\text{-}C_6H_{13}$
1745	C_2H_5	F	F	F	Bond	$n\text{-}C_7H_{15}$
1746	$n\text{-}C_3H_7$	F	F	F	Bond	CH_3
1747	$n\text{-}C_3H_7$	F	F	F	Bond	C_2H_5
1748	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_3H_7$
1749	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_4H_9$
1750	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_5H_{11}$
1751	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_6H_{13}$
1752	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_7H_{15}$
1753	$n\text{-}C_4H_9$	F	F	F	Bond	CH_3
1754	$n\text{-}C_4H_9$	F	F	F	Bond	C_2H_5
1755	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_3H_7$
1756	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_4H_9$
1757	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_5H_{11}$
1758	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_6H_{13}$
1759	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_7H_{15}$
1760	$n\text{-}C_5H_{11}$	F	F	F	Bond	CH_3
1761	$n\text{-}C_5H_{11}$	F	F	F	Bond	C_2H_5
1762	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_3H_7$
1763	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_4H_9$
1764	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_5H_{11}$
1765	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_6H_{13}$
1766	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 1767 - 1829
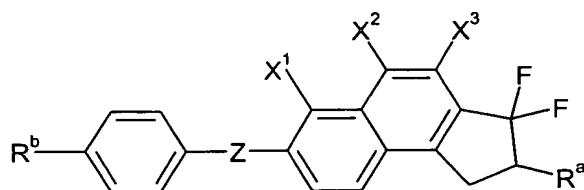
Example	R^b	X^1	X^2	X^3	Z	R^a
1767	CH_3	F	F	F	Bond	CH_3
1768	CH_3	F	F	F	Bond	C_2H_5
1769	CH_3	F	F	F	Bond	$n\text{-}C_3H_7$
1770	CH_3	F	F	F	Bond	$n\text{-}C_4H_9$
1771	CH_3	F	F	F	Bond	$n\text{-}C_5H_{11}$
1772	CH_3	F	F	F	Bond	$n\text{-}C_6H_{13}$
1773	CH_3	F	F	F	Bond	$n\text{-}C_7H_{15}$
1774	CH_3	F	F	F	CF_2CF_2	CH_3
1775	CH_3	F	F	F	CF_2CF_2	C_2H_5
1776	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1777	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1778	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1779	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1780	CH_3	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1781	CH_3	F	F	F	CF_2O	CH_3
1782	CH_3	F	F	F	CF_2O	C_2H_5
1783	CH_3	F	F	F	CF_2O	$n\text{-}C_3H_7$
1784	CH_3	F	F	F	CF_2O	$n\text{-}C_4H_9$
1785	CH_3	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
1786	CH_3	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
1787	CH_3	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
1788	C_2H_5	F	F	F	CF_2CF_2	CH_3
1789	C_2H_5	F	F	F	CF_2CF_2	C_2H_5
1790	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1791	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1792	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1793	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1794	C_2H_5	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1795	C_2H_5	F	F	F	CF_2O	CH_3
1796	C_2H_5	F	F	F	CF_2O	C_2H_5
1797	C_2H_5	F	F	F	CF_2O	$n\text{-}C_3H_7$
1798	C_2H_5	F	F	F	CF_2O	$n\text{-}C_4H_9$
1799	C_2H_5	F	F	F	CF_2O	$n\text{-}C_5H_{11}$

Example	R^b	X^1	X^2	X^3	Z	R^a
1800	C_2H_5	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
1801	C_2H_5	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
1802	C_2H_5	F	F	F	Bond	CH_3
1803	C_2H_5	F	F	F	Bond	C_2H_5
1804	C_2H_5	F	F	F	Bond	$n\text{-}C_3H_7$
1805	C_2H_5	F	F	F	Bond	$n\text{-}C_4H_9$
1806	C_2H_5	F	F	F	Bond	$n\text{-}C_5H_{11}$
1807	C_2H_5	F	F	F	Bond	$n\text{-}C_6H_{13}$
1808	C_2H_5	F	F	F	Bond	$n\text{-}C_7H_{15}$
1809	$n\text{-}C_3H_7$	F	F	F	Bond	CH_3
1810	$n\text{-}C_3H_7$	F	F	F	Bond	C_2H_5
1811	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_3H_7$
1812	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_4H_9$
1813	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_5H_{11}$
1814	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_6H_{13}$
1815	$n\text{-}C_3H_7$	F	F	F	Bond	$n\text{-}C_7H_{15}$
1816	$n\text{-}C_4H_9$	F	F	F	Bond	CH_3
1817	$n\text{-}C_4H_9$	F	F	F	Bond	C_2H_5
1818	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_3H_7$
1819	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_4H_9$
1820	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_5H_{11}$
1821	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_6H_{13}$
1822	$n\text{-}C_4H_9$	F	F	F	Bond	$n\text{-}C_7H_{15}$
1823	$n\text{-}C_5H_{11}$	F	F	F	Bond	CH_3
1824	$n\text{-}C_5H_{11}$	F	F	F	Bond	C_2H_5
1825	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_3H_7$
1826	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_4H_9$
1827	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_5H_{11}$
1828	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_6H_{13}$
1829	$n\text{-}C_5H_{11}$	F	F	F	Bond	$n\text{-}C_7H_{15}$

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Examples 1830 - 1871
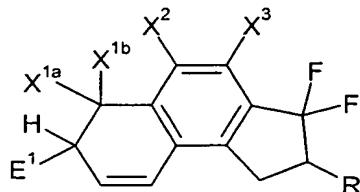
Example	E¹	X¹ᵃ	X¹ᵇ	X²	X³	R
1830	H	F	F	F	F	CH_3
1831	H	F	F	F	F	C_2H_5
1832	H	F	F	F	F	$n\text{-}C_3H_7$
1833	H	F	F	F	F	$n\text{-}C_4H_9$
1834	H	F	F	F	F	$n\text{-}C_5H_{11}$
1835	H	F	F	F	F	$n\text{-}C_6H_{13}$
1836	H	F	F	F	F	$n\text{-}C_7H_{15}$
1837	CH_3	F	F	F	F	CH_3
1838	CH_3	F	F	F	F	C_2H_5
1839	CH_3	F	F	F	F	$n\text{-}C_3H_7$
1840	CH_3	F	F	F	F	$n\text{-}C_4H_9$
1841	CH_3	F	F	F	F	$n\text{-}C_5H_{11}$
1842	CH_3	F	F	F	F	$n\text{-}C_6H_{13}$
1843	CH_3	F	F	F	F	$n\text{-}C_7H_{15}$
1844	C_2H_5	F	F	F	F	CH_3
1845	C_2H_5	F	F	F	F	C_2H_5
1846	C_2H_5	F	F	F	F	$n\text{-}C_3H_7$
1847	C_2H_5	F	F	F	F	$n\text{-}C_4H_9$
1848	C_2H_5	F	F	F	F	$n\text{-}C_5H_{11}$
1849	C_2H_5	F	F	F	F	$n\text{-}C_6H_{13}$
1850	C_2H_5	F	F	F	F	$n\text{-}C_7H_{15}$
1851	$n\text{-}C_3H_7$	F	F	F	F	CH_3
1852	$n\text{-}C_3H_7$	F	F	F	F	C_2H_5
1853	$n\text{-}C_3H_7$	F	F	F	F	$n\text{-}C_3H_7$
1854	$n\text{-}C_3H_7$	F	F	F	F	$n\text{-}C_4H_9$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
1855	$n-C_3H_7$	F	F	F	F	$n-C_5H_{11}$
1856	$n-C_3H_7$	F	F	F	F	$n-C_6H_{13}$
1857	$n-C_3H_7$	F	F	F	F	$n-C_7H_{15}$
1858	$n-C_4H_9$	F	F	F	F	CH_3
1859	$n-C_4H_9$	F	F	F	F	C_2H_5
1860	$n-C_4H_9$	F	F	F	F	$n-C_3H_7$
1861	$n-C_4H_9$	F	F	F	F	$n-C_4H_9$
1862	$n-C_4H_9$	F	F	F	F	$n-C_5H_{11}$
1863	$n-C_4H_9$	F	F	F	F	$n-C_6H_{13}$
1864	$n-C_4H_9$	F	F	F	F	$n-C_7H_{15}$
1865	$n-C_5H_{11}$	F	F	F	F	CH_3
1866	$n-C_5H_{11}$	F	F	F	F	C_2H_5
1867	$n-C_5H_{11}$	F	F	F	F	$n-C_3H_7$
1868	$n-C_5H_{11}$	F	F	F	F	$n-C_4H_9$
1869	$n-C_5H_{11}$	F	F	F	F	$n-C_5H_{11}$
1870	$n-C_5H_{11}$	F	F	F	F	$n-C_6H_{13}$
1871	$n-C_5H_{11}$	F	F	F	F	$n-C_7H_{15}$

Example 1872 - 1941
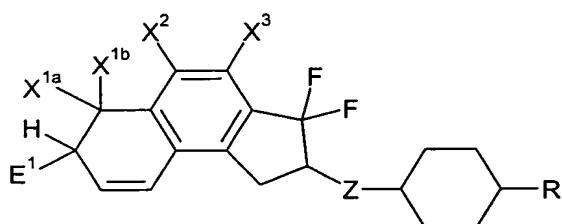
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1872	H	F	F	F	F	Bond	CH_3
1873	H	F	F	F	F	Bond	C_2H_5
1874	H	F	F	F	F	Bond	$n-C_3H_7$
1875	H	F	F	F	F	Bond	$n-C_4H_9$
1876	H	F	F	F	F	Bond	$n-C_5H_{11}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1877	H	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1878	H	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1879	H	F	F	F	F	CF_2CF_2	CH_3
1880	H	F	F	F	F	CF_2CF_2	C_2H_5
1881	H	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1882	H	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1883	H	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1884	H	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1885	H	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1886	H	F	F	F	F	OCF_2	CH_3
1887	H	F	F	F	F	OCF_2	C_2H_5
1888	H	F	F	F	F	OCF_2	$n\text{-}C_3H_7$
1889	H	F	F	F	F	OCF_2	$n\text{-}C_4H_9$
1890	H	F	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
1891	H	F	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
1892	H	F	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
1893	CH_3	F	F	F	F	Bond	CH_3
1894	CH_3	F	F	F	F	Bond	C_2H_5
1895	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
1896	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
1897	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1898	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1899	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1900	CH_3	F	F	F	F	CF_2CF_2	CH_3
1901	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
1902	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1903	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1904	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1905	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1906	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1907	CH_3	F	F	F	F	OCF_2	CH_3
1908	CH_3	F	F	F	F	OCF_2	C_2H_5
1909	CH_3	F	F	F	F	OCF_2	$n\text{-}C_3H_7$

Example	E¹	X^{1a}	X^{1b}	X²	X³	Z	R
1910	CH_3	F	F	F	F	OCF_2	$n-C_4H_9$
1911	CH_3	F	F	F	F	OCF_2	$n-C_5H_{11}$
1912	CH_3	F	F	F	F	OCF_2	$n-C_6H_{13}$
1913	CH_3	F	F	F	F	OCF_2	$n-C_7H_{15}$
1914	C_2H_5	F	F	F	F	Bond	CH_3
1915	C_2H_5	F	F	F	F	Bond	C_2H_5
1916	C_2H_5	F	F	F	F	Bond	$n-C_3H_7$
1917	C_2H_5	F	F	F	F	Bond	$n-C_4H_9$
1918	C_2H_5	F	F	F	F	Bond	$n-C_5H_{11}$
1919	C_2H_5	F	F	F	F	Bond	$n-C_6H_{13}$
1920	C_2H_5	F	F	F	F	Bond	$n-C_7H_{15}$
1921	$n-C_3H_7$	F	F	F	F	Bond	CH_3
1922	$n-C_3H_7$	F	F	F	F	Bond	C_2H_5
1923	$n-C_3H_7$	F	F	F	F	Bond	$n-C_3H_7$
1924	$n-C_3H_7$	F	F	F	F	Bond	$n-C_4H_9$
1925	$n-C_3H_7$	F	F	F	F	Bond	$n-C_5H_{11}$
1926	$n-C_3H_7$	F	F	F	F	Bond	$n-C_6H_{13}$
1927	$n-C_3H_7$	F	F	F	F	Bond	$n-C_7H_{15}$
1928	$n-C_4H_9$	F	F	F	F	Bond	CH_3
1929	$n-C_4H_9$	F	F	F	F	Bond	C_2H_5
1930	$n-C_4H_9$	F	F	F	F	Bond	$n-C_3H_7$
1931	$n-C_4H_9$	F	F	F	F	Bond	$n-C_4H_9$
1932	$n-C_4H_9$	F	F	F	F	Bond	$n-C_5H_{11}$
1933	$n-C_4H_9$	F	F	F	F	Bond	$n-C_6H_{13}$
1934	$n-C_4H_9$	F	F	F	F	Bond	$n-C_7H_{15}$
1935	$n-C_5H_{11}$	F	F	F	F	Bond	CH_3
1936	$n-C_5H_{11}$	F	F	F	F	Bond	C_2H_5
1937	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_3H_7$
1938	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_4H_9$
1939	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_5H_{11}$
1940	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_6H_{13}$
1941	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_7H_{15}$

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Examples 1942 - 2011
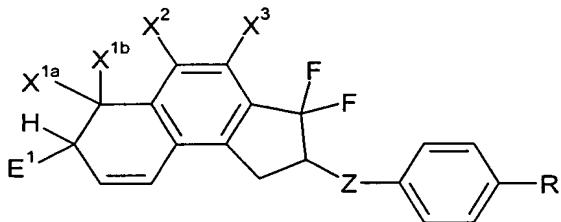
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1942	H	F	F	F	F	Bond	CH_3
1943	H	F	F	F	F	Bond	C_2H_5
1944	H	F	F	F	F	Bond	$n\text{-}C_3H_7$
1945	H	F	F	F	F	Bond	$n\text{-}C_4H_9$
1946	H	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
1947	H	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
1948	H	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
1949	H	F	F	F	F	CF_2CF_2	CH_3
1950	H	F	F	F	F	CF_2CF_2	C_2H_5
1951	H	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
1952	H	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
1953	H	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
1954	H	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
1955	H	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
1956	H	F	F	F	F	CF_2O	CH_3
1957	H	F	F	F	F	CF_2O	C_2H_5
1958	H	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
1959	H	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
1960	H	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
1961	H	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
1962	H	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
1963	CH_3	F	F	F	F	Bond	CH_3
1964	CH_3	F	F	F	F	Bond	C_2H_5
1965	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1966	CH_3	F	F	F	F	Bond	$n-C_4H_9$
1967	CH_3	F	F	F	F	Bond	$n-C_5H_{11}$
1968	CH_3	F	F	F	F	Bond	$n-C_6H_{13}$
1969	CH_3	F	F	F	F	Bond	$n-C_7H_{15}$
1970	CH_3	F	F	F	F	CF_2CF_2	CH_3
1971	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
1972	CH_3	F	F	F	F	CF_2CF_2	$n-C_3H_7$
1973	CH_3	F	F	F	F	CF_2CF_2	$n-C_4H_9$
1974	CH_3	F	F	F	F	CF_2CF_2	$n-C_5H_{11}$
1975	CH_3	F	F	F	F	CF_2CF_2	$n-C_6H_{13}$
1976	CH_3	F	F	F	F	CF_2CF_2	$n-C_7H_{15}$
1977	CH_3	F	F	F	F	CF_2O	CH_3
1978	CH_3	F	F	F	F	CF_2O	C_2H_5
1979	CH_3	F	F	F	F	CF_2O	$n-C_3H_7$
1980	CH_3	F	F	F	F	CF_2O	$n-C_4H_9$
1981	CH_3	F	F	F	F	CF_2O	$n-C_5H_{11}$
1982	CH_3	F	F	F	F	CF_2O	$n-C_6H_{13}$
1983	CH_3	F	F	F	F	CF_2O	$n-C_7H_{15}$
1984	C_2H_5	F	F	F	F	Bond	CH_3
1985	C_2H_5	F	F	F	F	Bond	C_2H_5
1986	C_2H_5	F	F	F	F	Bond	$n-C_3H_7$
1987	C_2H_5	F	F	F	F	Bond	$n-C_4H_9$
1988	C_2H_5	F	F	F	F	Bond	$n-C_5H_{11}$
1989	C_2H_5	F	F	F	F	Bond	$n-C_6H_{13}$
1990	C_2H_5	F	F	F	F	Bond	$n-C_7H_{15}$
1991	$n-C_3H_7$	F	F	F	F	Bond	CH_3
1992	$n-C_3H_7$	F	F	F	F	Bond	C_2H_5
1993	$n-C_3H_7$	F	F	F	F	Bond	$n-C_3H_7$
1994	$n-C_3H_7$	F	F	F	F	Bond	$n-C_4H_9$
1995	$n-C_3H_7$	F	F	F	F	Bond	$n-C_5H_{11}$
1996	$n-C_3H_7$	F	F	F	F	Bond	$n-C_6H_{13}$
1997	$n-C_3H_7$	F	F	F	F	Bond	$n-C_7H_{15}$
1998	$n-C_4H_9$	F	F	F	F	Bond	CH_3

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
1999	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
2000	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2001	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2002	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2003	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2004	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2005	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
2006	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
2007	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2008	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2009	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2010	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2011	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 2012 - 2081
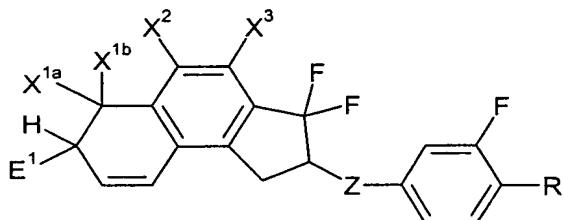
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2012	H	F	F	F	F	Bond	CH_3
2013	H	F	F	F	F	Bond	C_2H_5
2014	H	F	F	F	F	Bond	$n\text{-}C_3H_7$
2015	H	F	F	F	F	Bond	$n\text{-}C_4H_9$
2016	H	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2017	H	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2018	H	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2019	H	F	F	F	F	CF_2CF_2	CH_3
2020	H	F	F	F	F	CF_2CF_2	C_2H_5

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2021	H	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2022	H	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2023	H	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2024	H	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2025	H	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2026	H	F	F	F	F	CF_2O	CH_3
2027	H	F	F	F	F	CF_2O	C_2H_5
2028	H	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
2029	H	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
2030	H	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
2031	H	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
2032	H	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
2033	CH_3	F	F	F	F	Bond	CH_3
2034	CH_3	F	F	F	F	Bond	C_2H_5
2035	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
2036	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
2037	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2038	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2039	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2040	CH_3	F	F	F	F	CF_2CF_2	CH_3
2041	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
2042	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2043	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2044	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2045	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2046	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2047	CH_3	F	F	F	F	CF_2O	CH_3
2048	CH_3	F	F	F	F	CF_2O	C_2H_5
2049	CH_3	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
2050	CH_3	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
2051	CH_3	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
2052	CH_3	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
2053	CH_3	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2054	C$_2$H$_5$	F	F	F	F	Bond	CH$_3$
2055	C$_2$H$_5$	F	F	F	F	Bond	C$_2$H$_5$
2056	C$_2$H$_5$	F	F	F	F	Bond	n-C$_3$H$_7$
2057	C$_2$H$_5$	F	F	F	F	Bond	n-C$_4$H$_9$
2058	C$_2$H$_5$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2059	C$_2$H$_5$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2060	C$_2$H$_5$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2061	n-C$_3$H$_7$	F	F	F	F	Bond	CH$_3$
2062	n-C$_3$H$_7$	F	F	F	F	Bond	C$_2$H$_5$
2063	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_3$H$_7$
2064	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_4$H$_9$
2065	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2066	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2067	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2068	n-C$_4$H$_9$	F	F	F	F	Bond	CH$_3$
2069	n-C$_4$H$_9$	F	F	F	F	Bond	C$_2$H$_5$
2070	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_3$H$_7$
2071	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_4$H$_9$
2072	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2073	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2074	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2075	n-C$_5$H$_{11}$	F	F	F	F	Bond	CH$_3$
2076	n-C$_5$H$_{11}$	F	F	F	F	Bond	C$_2$H$_5$
2077	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_3$H$_7$
2078	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_4$H$_9$
2079	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2080	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2081	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_7$H$_{15}$

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Examples 2082 - 2130

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R^b—cyclohexyl—Z—[structure with H, X^{1a}, X^{1b}, X^2, X^3, F, F, R^a]
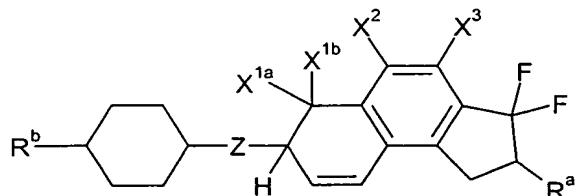
Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2082	CH_3	F	F	F	F	Bond	CH_3
2083	CH_3	F	F	F	F	Bond	C_2H_5
2084	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
2085	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
2086	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2087	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2088	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2089	CH_3	F	F	F	F	CF_2CF_2	CH_3
2090	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
2091	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2092	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2093	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2094	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2095	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2096	C_2H_5	F	F	F	F	CF_2CF_2	CH_3
2097	C_2H_5	F	F	F	F	CF_2CF_2	C_2H_5
2098	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2099	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2100	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2101	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2102	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2103	C_2H_5	F	F	F	F	Bond	CH_3
2104	C_2H_5	F	F	F	F	Bond	C_2H_5
2105	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
2106	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
2107	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$

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Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2108	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2109	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2110	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
2111	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
2112	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2113	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2114	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2115	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2116	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2117	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
2118	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
2119	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2120	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2121	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2122	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2123	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2124	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
2125	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
2126	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2127	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2128	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2129	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2130	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 2131 - 2193
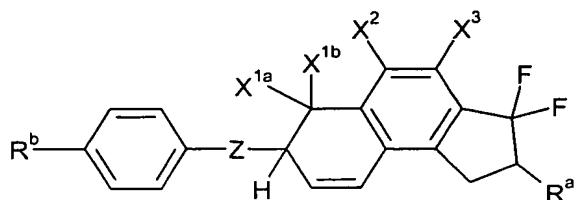
Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2131	CH_3	F	F	F	F	Bond	CH_3
2132	CH_3	F	F	F	F	Bond	C_2H_5
2133	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
2134	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
2135	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2136	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2137	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2138	CH_3	F	F	F	F	CF_2CF_2	CH_3
2139	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
2140	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2141	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2142	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2143	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2144	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2145	CH_3	F	F	F	F	OCF_2	CH_3
2146	CH_3	F	F	F	F	OCF_2	C_2H_5
2147	CH_3	F	F	F	F	OCF_2	$n\text{-}C_3H_7$
2148	CH_3	F	F	F	F	OCF_2	$n\text{-}C_4H_9$
2149	CH_3	F	F	F	F	OCF_2	$n\text{-}C_5H_{11}$
2150	CH_3	F	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
2151	CH_3	F	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
2152	C_2H_5	F	F	F	F	CF_2CF_2	CH_3
2153	C_2H_5	F	F	F	F	CF_2CF_2	C_2H_5
2154	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2155	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2156	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2157	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2158	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2159	C_2H_5	F	F	F	F	OCF_2	CH_3
2160	C_2H_5	F	F	F	F	OCF_2	C_2H_5
2161	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_3H_7$
2162	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_4H_9$
2163	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_5H_{11}$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2164	C$_2$H$_5$	F	F	F	F	OCF$_2$	n-C$_6$H$_{13}$
2165	C$_2$H$_5$	F	F	F	F	OCF$_2$	n-C$_7$H$_{15}$
2166	C$_2$H$_5$	F	F	F	F	Bond	CH$_3$
2167	C$_2$H$_5$	F	F	F	F	Bond	C$_2$H$_5$
2168	C$_2$H$_5$	F	F	F	F	Bond	n-C$_3$H$_7$
2169	C$_2$H$_5$	F	F	F	F	Bond	n-C$_4$H$_9$
2170	C$_2$H$_5$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2171	C$_2$H$_5$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2172	C$_2$H$_5$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2173	n-C$_3$H$_7$	F	F	F	F	Bond	CH$_3$
2174	n-C$_3$H$_7$	F	F	F	F	Bond	C$_2$H$_5$
2175	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_3$H$_7$
2176	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_4$H$_9$
2177	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2178	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2179	n-C$_3$H$_7$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2180	n-C$_4$H$_9$	F	F	F	F	Bond	CH$_3$
2181	n-C$_4$H$_9$	F	F	F	F	Bond	C$_2$H$_5$
2182	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_3$H$_7$
2183	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_4$H$_9$
2184	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2185	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2186	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2187	n-C$_5$H$_{11}$	F	F	F	F	Bond	CH$_3$
2188	n-C$_5$H$_{11}$	F	F	F	F	Bond	C$_2$H$_5$
2189	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_3$H$_7$
2190	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_4$H$_9$
2191	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2192	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2193	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_7$H$_{15}$

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Examples 2194 - 2235

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X^{1a} X^{1b} X^2 X^3 F F H E^1 R
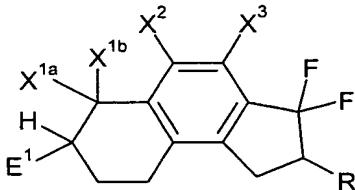
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
2194	H	F	F	F	F	CH_3
2195	H	F	F	F	F	C_2H_5
2196	H	F	F	F	F	$n\text{-}C_3H_7$
2197	H	F	F	F	F	$n\text{-}C_4H_9$
2198	H	F	F	F	F	$n\text{-}C_5H_{11}$
2199	H	F	F	F	F	$n\text{-}C_6H_{13}$
2200	H	F	F	F	F	$n\text{-}C_7H_{15}$
2201	CH_3	F	F	F	F	CH_3
2202	CH_3	F	F	F	F	C_2H_5
2203	CH_3	F	F	F	F	$n\text{-}C_3H_7$
2204	CH_3	F	F	F	F	$n\text{-}C_4H_9$
2205	CH_3	F	F	F	F	$n\text{-}C_5H_{11}$
2206	CH_3	F	F	F	F	$n\text{-}C_6H_{13}$
2207	CH_3	F	F	F	F.	$n\text{-}C_7H_{15}$
2208	C_2H_5	F	F	F	F	CH_3
2209	C_2H_5	F	F	F	F	C_2H_5
2210	C_2H_5	F	F	F	F	$n\text{-}C_3H_7$
2211	C_2H_5	F	F	F	F	$n\text{-}C_4H_9$
2212	C_2H_5	F	F	F	F	$n\text{-}C_5H_{11}$
2213	C_2H_5	F	F	F	F	$n\text{-}C_6H_{13}$
2214	C_2H_5	F	F	F	F	$n\text{-}C_7H_{15}$
2215	$n\text{-}C_3H_7$	F	F	F	F	CH_3
2216	$n\text{-}C_3H_7$	F	F	F	F	C_2H_5
2217	$n\text{-}C_3H_7$	F	F	F	F	$n\text{-}C_3H_7$
2218	$n\text{-}C_3H_7$	F	F	F	F	$n\text{-}C_4H_9$
2219	$n\text{-}C_3H_7$	F	F	F	F	$n\text{-}C_5H_{11}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	R
2220	$n\text{-}C_3H_7$	F	F	F	F	$n\text{-}C_6H_{13}$
2221	$n\text{-}C_3H_7$	F	F	F	F	$n\text{-}C_7H_{15}$
2222	$n\text{-}C_4H_9$	F	F	F	F	CH_3
2223	$n\text{-}C_4H_9$	F	F	F	F	C_2H_5
2224	$n\text{-}C_4H_9$	F	F	F	F	$n\text{-}C_3H_7$
2225	$n\text{-}C_4H_9$	F	F	F	F	$n\text{-}C_4H_9$
2226	$n\text{-}C_4H_9$	F	F	F	F	$n\text{-}C_5H_{11}$
2227	$n\text{-}C_4H_9$	F	F	F	F	$n\text{-}C_6H_{13}$
2228	$n\text{-}C_4H_9$	F	F	F	F	$n\text{-}C_7H_{15}$
2229	$n\text{-}C_5H_{11}$	F	F	F	F	CH_3
2230	$n\text{-}C_5H_{11}$	F	F	F	F	C_2H_5
2231	$n\text{-}C_5H_{11}$	F	F	F	F	$n\text{-}C_3H_7$
2232	$n\text{-}C_5H_{11}$	F	F	F	F	$n\text{-}C_4H_9$
2233	$n\text{-}C_5H_{11}$	F	F	F	F	$n\text{-}C_5H_{11}$
2234	$n\text{-}C_5H_{11}$	F	F	F	F	$n\text{-}C_6H_{13}$
2235	$n\text{-}C_5H_{11}$	F	F	F	F	$n\text{-}C_7H_{15}$

Examples 2236 - 2305
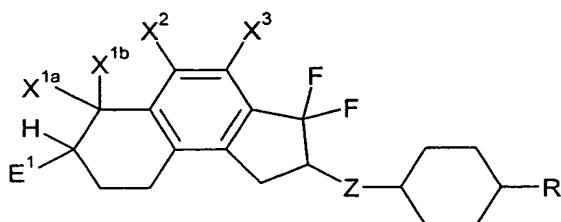
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2236	H	F	F	F	F	Bond	CH_3
2237	H	F	F	F	F	Bond	C_2H_5
2238	H	F	F	F	F	Bond	$n\text{-}C_3H_7$
2239	H	F	F	F	F	Bond	$n\text{-}C_4H_9$
2240	H	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2241	H	F	F	F	F	Bond	$n\text{-}C_6H_{13}$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2242	H	F	F	F	F	Bond	n-C$_7$H$_{15}$
2243	H	F	F	F	F	CF$_2$CF$_2$	CH$_3$
2244	H	F	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
2245	H	F	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
2246	H	F	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$
2247	H	F	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
2248	H	F	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
2249	H	F	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$
2250	H	F	F	F	F	OCF$_2$	CH$_3$
2251	H	F	F	F	F	OCF$_2$	C$_2$H$_5$
2252	H	F	F	F	F	OCF$_2$	n-C$_3$H$_7$
2253	H	F	F	F	F	OCF$_2$	n-C$_4$H$_9$
2254	H	F	F	F	F	OCF$_2$	n-C$_5$H$_{11}$
2255	H	F	F	F	F	OCF$_2$	n-C$_6$H$_{13}$
2256	H	F	F	F	F	OCF$_2$	n-C$_7$H$_{15}$
2257	CH$_3$	F	F	F	F	Bond	CH$_3$
2258	CH$_3$	F	F	F	F	Bond	C$_2$H$_5$
2259	CH$_3$	F	F	F	F	Bond	n-C$_3$H$_7$
2260	CH$_3$	F	F	F	F	Bond	n-C$_4$H$_9$
2261	CH$_3$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2262	CH$_3$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2263	CH$_3$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2264	CH$_3$	F	F	F	F	CF$_2$CF$_2$	CH$_3$
2265	CH$_3$	F	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
2266	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$
2267	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_4$H$_9$
2268	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_5$H$_{11}$
2269	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_6$H$_{13}$
2270	CH$_3$	F	F	F	F	CF$_2$CF$_2$	n-C$_7$H$_{15}$
2271	CH$_3$	F	F	F	F	OCF$_2$	CH$_3$
2272	CH$_3$	F	F	F	F	OCF$_2$	C$_2$H$_5$
2273	CH$_3$	F	F	F	F	OCF$_2$	n-C$_3$H$_7$
2274	CH$_3$	F	F	F	F	OCF$_2$	n-C$_4$H$_9$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2275	CH_3	F	F	F	F	OCF_2	$n-C_5H_{11}$
2276	CH_3	F	F	F	F	OCF_2	$n-C_6H_{13}$
2277	CH_3	F	F	F	F	OCF_2	$n-C_7H_{15}$
2278	C_2H_5	F	F	F	F	Bond	CH_3
2279	C_2H_5	F	F	F	F	Bond	C_2H_5
2280	C_2H_5	F	F	F	F	Bond	$n-C_3H_7$
2281	C_2H_5	F	F	F	F	Bond	$n-C_4H_9$
2282	C_2H_5	F	F	F	F	Bond	$n-C_5H_{11}$
2283	C_2H_5	F	F	F	F	Bond	$n-C_6H_{13}$
2284	C_2H_5	F	F	F	F	Bond	$n-C_7H_{15}$
2285	$n-C_3H_7$	F	F	F	F	Bond	CH_3
2286	$n-C_3H_7$	F	F	F	F	Bond	C_2H_5
2287	$n-C_3H_7$	F	F	F	F	Bond	$n-C_3H_7$
2288	$n-C_3H_7$	F	F	F	F	Bond	$n-C_4H_9$
2289	$n-C_3H_7$	F	F	F	F	Bond	$n-C_5H_{11}$
2290	$n-C_3H_7$	F	F	F	F	Bond	$n-C_6H_{13}$
2291	$n-C_3H_7$	F	F	F	F	Bond	$n-C_7H_{15}$
2292	$n-C_4H_9$	F	F	F	F	Bond	CH_3
2293	$n-C_4H_9$	F	F	F	F	Bond	C_2H_5
2294	$n-C_4H_9$	F	F	F	F	Bond	$n-C_3H_7$
2295	$n-C_4H_9$	F	F	F	F	Bond	$n-C_4H_9$
2296	$n-C_4H_9$	F	F	F	F	Bond	$n-C_5H_{11}$
2297	$n-C_4H_9$	F	F	F	F	Bond	$n-C_6H_{13}$
2298	$n-C_4H_9$	F	F	F	F	Bond	$n-C_7H_{15}$
2299	$n-C_5H_{11}$	F	F	F	F	Bond	CH_3
2300	$n-C_5H_{11}$	F	F	F	F	Bond	C_2H_5
2301	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_3H_7$
2302	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_4H_9$
2303	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_5H_{11}$
2304	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_6H_{13}$
2305	$n-C_5H_{11}$	F	F	F	F	Bond	$n-C_7H_{15}$

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Examples 2306 - 2375
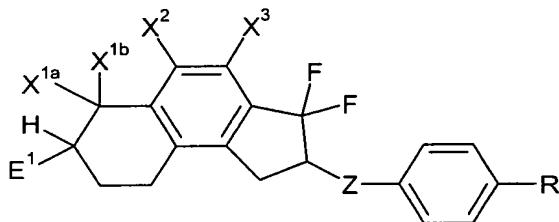
Example	E¹	X¹ᵃ	X¹ᵇ	X²	X³	Z	R
2306	H	F	F	F	F	Bond	CH_3
2307	H	F	F	F	F	Bond	C_2H_5
2308	H	F	F	F	F	Bond	$n\text{-}C_3H_7$
2309	H	F	F	F	F	Bond	$n\text{-}C_4H_9$
2310	H	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2311	H	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2312	H	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2313	H	F	F	F	F	CF_2CF_2	CH_3
2314	H	F	F	F	F	CF_2CF_2	C_2H_5
2315	H	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2316	H	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2317	H	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2318	H	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2319	H	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2320	H	F	F	F	F	CF_2O	CH_3
2321	H	F	F	F	F	CF_2O	C_2H_5
2322	H	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
2323	H	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
2324	H	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
2325	H	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
2326	H	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
2327	CH_3	F	F	F	F	Bond	CH_3
2328	CH_3	F	F	F	F	Bond	C_2H_5
2329	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
2330	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2331	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2332	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2333	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2334	CH_3	F	F	F	F	CF_2CF_2	CH_3
2335	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
2336	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2337	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2338	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2339	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2340	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2341	CH_3	F	F	F	F	CF_2O	CH_3
2342	CH_3	F	F	F	F	CF_2O	C_2H_5
2343	CH_3	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
2344	CH_3	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
2345	CH_3	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
2346	CH_3	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
2347	CH_3	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
2348	C_2H_5	F	F	F	F	Bond	CH_3
2349	C_2H_5	F	F	F	F	Bond	C_2H_5
2350	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
2351	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
2352	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2353	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2354	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2355	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
2356	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
2357	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2358	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2359	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2360	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2361	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2362	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
2363	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5

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Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2364	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_3$H$_7$
2365	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_4$H$_9$
2366	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2367	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2368	n-C$_4$H$_9$	F	F	F	F	Bond	n-C$_7$H$_{15}$
2369	n-C$_5$H$_{11}$	F	F	F	F	Bond	CH$_3$
2370	n-C$_5$H$_{11}$	F	F	F	F	Bond	C$_2$H$_5$
2371	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_3$H$_7$
2372	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_4$H$_9$
2373	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_5$H$_{11}$
2374	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_6$H$_{13}$
2375	n-C$_5$H$_{11}$	F	F	F	F	Bond	n-C$_7$H$_{15}$

Examples 2376 - 2445
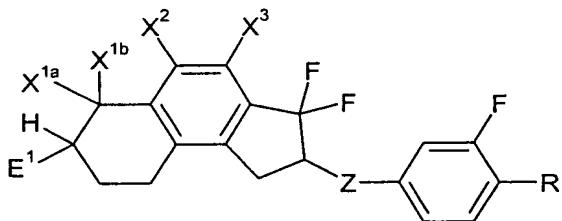
Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2376	H	F	F	F	F	Bond	CH$_3$
2377	H	F	F	F	F	Bond	C$_2$H$_5$
2378	H	F	F	F	F	Bond	n-C$_3$H$_7$
2379	H	F	F	F	F	Bond	n-C$_4$H$_9$
2380	H	F	F	F	F	Bond	n-C$_5$H$_{11}$
2381	H	F	F	F	F	Bond	n-C$_6$H$_{13}$
2382	H	F	F	F	F	Bond	n-C$_7$H$_{15}$
2383	H	F	F	F	F	CF$_2$CF$_2$	CH$_3$
2384	H	F	F	F	F	CF$_2$CF$_2$	C$_2$H$_5$
2385	H	F	F	F	F	CF$_2$CF$_2$	n-C$_3$H$_7$

Example	E^1	X^{1a}	X^{1b}	X^2	X^3	Z	R
2386	H	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2387	H	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2388	H	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2389	H	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2390	H	F	F	F	F	CF_2O	CH_3
2391	H	F	F	F	F	CF_2O	C_2H_5
2392	H	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
2393	H	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
2394	H	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
2395	H	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
2396	H	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
2397	CH_3	F	F	F	F	Bond	CH_3
2398	CH_3	F	F	F	F	Bond	C_2H_5
2399	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
2400	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
2401	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2402	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2403	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2404	CH_3	F	F	F	F	CF_2CF_2	CH_3
2405	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
2406	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2407	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2408	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2409	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2410	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2411	CH_3	F	F	F	F	CF_2O	CH_3
2412	CH_3	F	F	F	F	CF_2O	C_2H_5
2413	CH_3	F	F	F	F	CF_2O	$n\text{-}C_3H_7$
2414	CH_3	F	F	F	F	CF_2O	$n\text{-}C_4H_9$
2415	CH_3	F	F	F	F	CF_2O	$n\text{-}C_5H_{11}$
2416	CH_3	F	F	F	F	CF_2O	$n\text{-}C_6H_{13}$
2417	CH_3	F	F	F	F	CF_2O	$n\text{-}C_7H_{15}$
2418	C_2H_5	F	F	F	F	Bond	CH_3

Example	E¹	X¹ᵃ	X¹ᵇ	X²	X³	Z	R
2419	C_2H_5	F	F	F	F	Bond	C_2H_5
2420	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
2421	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
2422	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2423	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2424	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2425	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
2426	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
2427	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2428	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2429	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2430	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2431	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2432	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
2433	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
2434	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2435	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2436	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2437	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2438	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2439	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
2440	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
2441	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2442	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2443	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2444	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2445	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 2446 - 2494

5
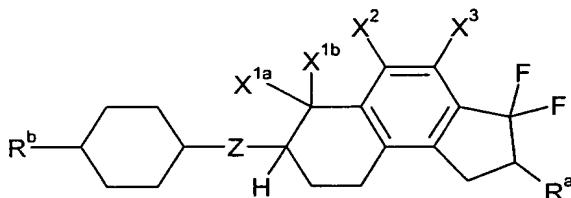
Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2446	CH_3	F	F	F	F	Bond	CH_3
2447	CH_3	F	F	F	F	Bond	C_2H_5
2448	CH_3	F	F	F	F	Bond	$n\text{-}C_3H_7$
2449	CH_3	F	F	F	F	Bond	$n\text{-}C_4H_9$
2450	CH_3	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2451	CH_3	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2452	CH_3	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2453	CH_3	F	F	F	F	CF_2CF_2	CH_3
2454	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
2455	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2456	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2457	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2458	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2459	CH_3	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2460	C_2H_5	F	F	F	F	CF_2CF_2	CH_3
2461	C_2H_5	F	F	F	F	CF_2CF_2	C_2H_5
2462	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_3H_7$
2463	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_4H_9$
2464	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_5H_{11}$
2465	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_6H_{13}$
2466	C_2H_5	F	F	F	F	CF_2CF_2	$n\text{-}C_7H_{15}$
2467	C_2H_5	F	F	F	F	Bond	CH_3
2468	C_2H_5	F	F	F	F	Bond	C_2H_5
2469	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
2470	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
2471	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2472	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2473	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2474	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
2475	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
2476	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2477	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2478	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2479	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2480	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2481	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
2482	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
2483	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2484	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2485	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2486	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2487	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2488	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
2489	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
2490	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2491	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2492	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2493	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2494	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Examples 2495 - 2557
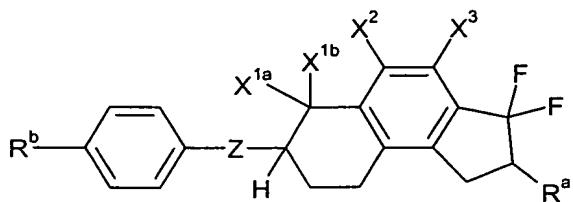
Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2495	CH_3	F	F	F	F	Bond	CH_3
2496	CH_3	F	F	F	F	Bond	C_2H_5
2497	CH_3	F	F	F	F	Bond	$n-C_3H_7$
2498	CH_3	F	F	F	F	Bond	$n-C_4H_9$
2499	CH_3	F	F	F	F	Bond	$n-C_5H_{11}$
2500	CH_3	F	F	F	F	Bond	$n-C_6H_{13}$
2501	CH_3	F	F	F	F	Bond	$n-C_7H_{15}$
2502	CH_3	F	F	F	F	CF_2CF_2	CH_3
2503	CH_3	F	F	F	F	CF_2CF_2	C_2H_5
2504	CH_3	F	F	F	F	CF_2CF_2	$n-C_3H_7$
2505	CH_3	F	F	F	F	CF_2CF_2	$n-C_4H_9$
2506	CH_3	F	F	F	F	CF_2CF_2	$n-C_5H_{11}$
2507	CH_3	F	F	F	F	CF_2CF_2	$n-C_6H_{13}$
2508	CH_3	F	F	F	F	CF_2CF_2	$n-C_7H_{15}$
2509	CH_3	F	F	F	F	OCF_2	CH_3
2510	CH_3	F	F	F	F	OCF_2	C_2H_5
2511	CH_3	F	F	F	F	OCF_2	$n-C_3H_7$
2512	CH_3	F	F	F	F	OCF_2	$n-C_4H_9$
2513	CH_3	F	F	F	F	OCF_2	$n-C_5H_{11}$
2514	CH_3	F	F	F	F	OCF_2	$n-C_6H_{13}$
2515	CH_3	F	F	F	F	OCF_2	$n-C_7H_{15}$
2516	C_2H_5	F	F	F	F	CF_2CF_2	CH_3
2517	C_2H_5	F	F	F	F	CF_2CF_2	C_2H_5
2518	C_2H_5	F	F	F	F	CF_2CF_2	$n-C_3H_7$
2519	C_2H_5	F	F	F	F	CF_2CF_2	$n-C_4H_9$
2520	C_2H_5	F	F	F	F	CF_2CF_2	$n-C_5H_{11}$
2521	C_2H_5	F	F	F	F	CF_2CF_2	$n-C_6H_{13}$
2522	C_2H_5	F	F	F	F	CF_2CF_2	$n-C_7H_{15}$
2523	C_2H_5	F	F	F	F	OCF_2	CH_3
2524	C_2H_5	F	F	F	F	OCF_2	C_2H_5
2525	C_2H_5	F	F	F	F	OCF_2	$n-C_3H_7$
2526	C_2H_5	F	F	F	F	OCF_2	$n-C_4H_9$
2527	C_2H_5	F	F	F	F	OCF_2	$n-C_5H_{11}$

Example	R^b	X^{1a}	X^{1b}	X^2	X^3	Z	R^a
2528	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_6H_{13}$
2529	C_2H_5	F	F	F	F	OCF_2	$n\text{-}C_7H_{15}$
2530	C_2H_5	F	F	F	F	Bond	CH_3
2531	C_2H_5	F	F	F	F	Bond	C_2H_5
2532	C_2H_5	F	F	F	F	Bond	$n\text{-}C_3H_7$
2533	C_2H_5	F	F	F	F	Bond	$n\text{-}C_4H_9$
2534	C_2H_5	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2535	C_2H_5	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2536	C_2H_5	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2537	$n\text{-}C_3H_7$	F	F	F	F	Bond	CH_3
2538	$n\text{-}C_3H_7$	F	F	F	F	Bond	C_2H_5
2539	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2540	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2541	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2542	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2543	$n\text{-}C_3H_7$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2544	$n\text{-}C_4H_9$	F	F	F	F	Bond	CH_3
2545	$n\text{-}C_4H_9$	F	F	F	F	Bond	C_2H_5
2546	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2547	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2548	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2549	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2550	$n\text{-}C_4H_9$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$
2551	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	CH_3
2552	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	C_2H_5
2553	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_3H_7$
2554	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_4H_9$
2555	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_5H_{11}$
2556	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_6H_{13}$
2557	$n\text{-}C_5H_{11}$	F	F	F	F	Bond	$n\text{-}C_7H_{15}$

Table 1

Δε- and Δn values for substances of individual examples

Example No.	Δε	Δn
10 (Comp. 33)	-7.4	0.186
80	-9.0	0.116
126	-8.4	0.100
154	-9.7	0.107
504	-8.5	0.124
2198	-10.7	0.067
2238	-6.0	0.070